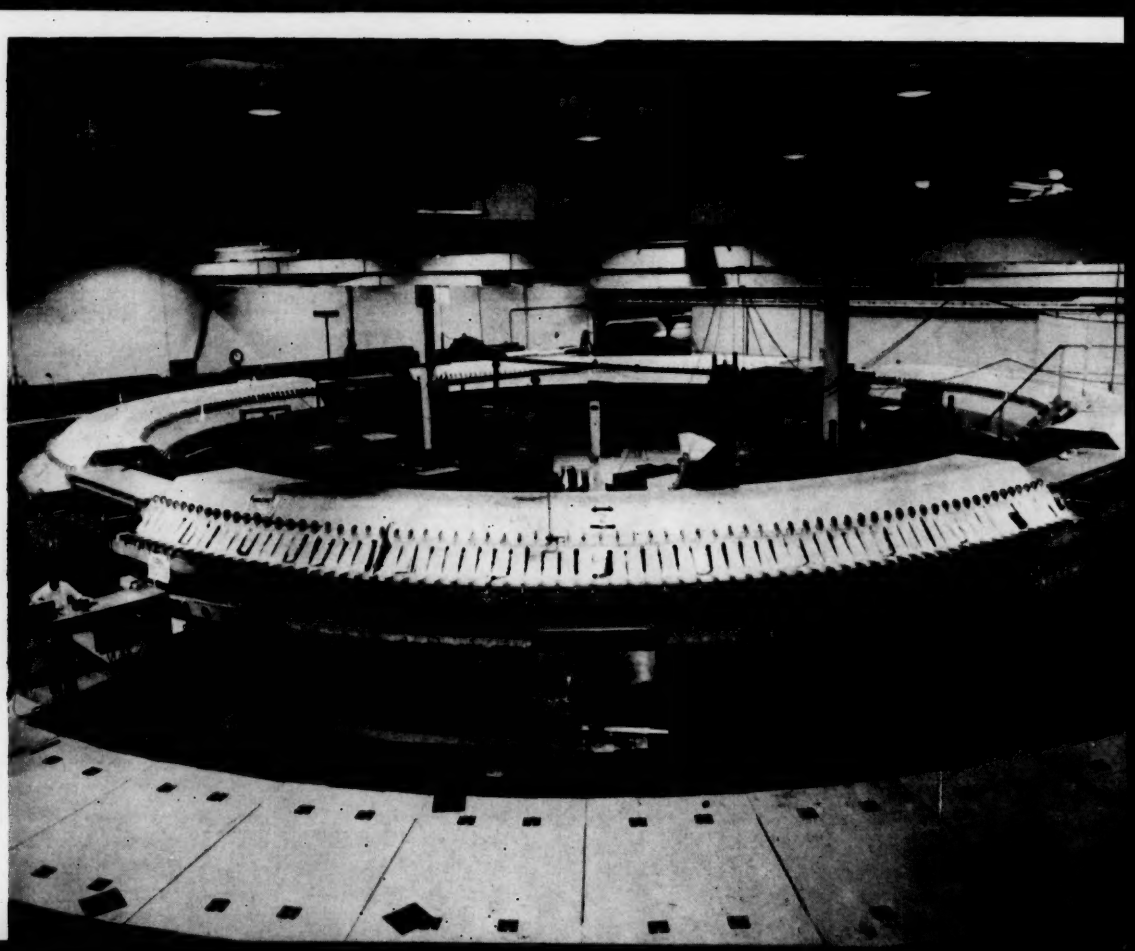
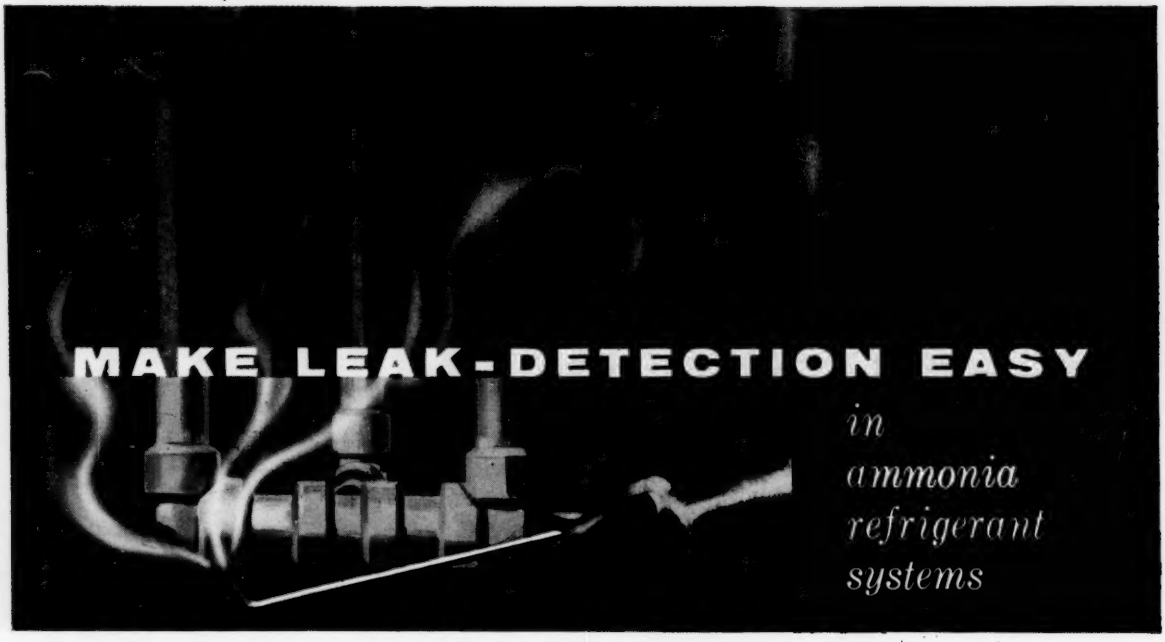
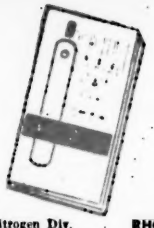




. . . Just contact your local distributor of Barrett® Brand Anhydrous Ammonia, listed below. He'll be happy to supply you with handy "Sulfstix" Ammonia Leak Detectors. And you can count on him for prompt, courteous service on Barrett Brand Ammonia – the purest, *driest* refrigeration grade ammonia you can buy!



COLORADO
Denver: Mine & Smelter Supply Co. 3800 Race St. P. O. Box 9041

CONNECTICUT
W. Hartford: The Christian Petersen & Son Co. 26 Brook St., P. O. Box 247

FLORIDA
Jacksonville: D. W. Anderson 615 E. Bay St. P. O. Box 1346
Miami: Columbia Chemical & Supply Co., 7430 N.E. 4th Ct. P. O. Box 967
Tampa: Food Equipment & Supply Co., 1809 2nd Ave. P. O. Box 422

GEORGIA
Macon: The Anderson Chemical Co., Inc., 1620 Waterville Rd. P. O. Box 1424

ILLINOIS
Centralia: Kem-I-Kal Engineering Laboratories, Inc., Pearcy & Broadway
Chicago: Westland Engineering Supply Co. 53 W. Jackson Blvd.

INDIANA
South Bend: Mid-Continent Chemicals, Inc. 2217 So. Main St.

IOWA
Burlington: McKesson & Robbins, Inc., West Central District Off. 100 N. 4th St. P. O. Box 591
Cedar Rapids: McKesson & Robbins, Inc. Cedar Rapids Div., 900 2nd St., S.E.
Ottumwa: J. W. Edgerly & Co., 120 W. Main St.
Sioux City: McKesson & Robbins, Inc., Sioux City Div., 308 Pearl St.

KANSAS
Wichita: Reid Supply Co. 306 W. 2nd St.

KENTUCKY
Henderson: P. B. & S. Chemical Co., 1100 N. Adams St.
Louisville: Griffin Chemical Co., 528 Franklin St.

LOUISIANA
New Orleans: Sam Reisfeld & Son, 649 South Galvez St.
Shreveport: Thompson-Hayward Chemical Co., 219 Beech St.

MAINE
Portland: Acme Engineering Co., 46 Market St.

MARYLAND
Baltimore: Leidy Chemicals Corp., 920 S. Eutaw St.

MASSACHUSETTS
Attleboro: Reynolds & Markman, Inc., 88 Union St.
Springfield: The Chemical Corp., 54 Waltham Ave.
West Springfield: Barker Chemical Co., 101 Circuit Ave. P. O. Box 173
Worcester: Brewer & Co., Inc., Ind. Chem. Div., 45 Arctic St.
Worcester: Chemical Sales & Service Co., Inc. 45-61 Freemont St.

MICHIGAN
Detroit: Eaton Chemical & Dyestuff Co., 1490 Franklin St.

MINNESOTA
St. Paul: Lyon Chemicals, Inc. 2305 Hampden Ave.

MISSOURI
Kansas City: Abner Hood Chemical Co., 507-517 N. Montgall Ave.
St. Louis: Nitrogen Div. Allied Chemical & Dye Corp., 4528 South Broadway
St. Louis: McKesson & Robbins, Inc., Chemical Div., 904 Landreth Bldg., 320 N. 4th St.
St. Louis: G. S. Robins & Co. 126 Chouteau Ave.

NEBRASKA
Omaha: McKesson & Robbins, Inc., Omaha Div. 902 Farnam St.

NEW JERSEY
Edgewater: Nitrogen Div. Allied Chemical & Dye Corp., 1 River Road
East Paterson: Aetna Color and Chemical Co. 60 Linden Ave.
Paterson: Lotte Chemical Corp. 109 5th Ave.
Paterson: Seaboard Industries 195 Keen St.

NEW YORK
Albany: Albany Laboratories, Inc., 67 Howard St.
Bklyn: Tex-Ite Products Corp. 555 Park Ave.
Buffalo: Commercial Chemicals, Inc., 211 Hertel Ave.
East Syracuse: Gleason Materials & Equipment Co., Inc., 130 Headson Drive.
New York: Nitrogen Div. Allied Chemical & Dye Corp., 40 Rector St.
New York: N. H. Heyman, Inc., 168 E. 91st St.
New York: E. M. Sergeant Pulp & Chemical Co. 7 Dey St.
Poughkeepsie: Duso Chemical Co., Inc., Fulton & Fairview St. P. O. Box 665
Rochester: Wm. B. Duffy Carting Co., 62 Scio St.

NORTH CAROLINA
Charlotte: Acme Soap & Chemical Co. Pineville Road

OHIO
Cleveland: Harshaw Chemical Co., 1945 E. 97th St.
Cincinnati: Merchants Chemical Co., Inc. 2933 Spring Grove Ave.
Toledo: Inland Chemical & Solvent Corp. 1775 Dorr St.

OKLAHOMA
Okla. City: Rex Engineering & Sales Co., 2735 N.W. 10th St. P. O. Box 5141
Tulsa: Vaughn Chemical Co. 1102 E. 3rd St.

PENNSYLVANIA
Altoona: Western Pennsylvania Chem. Co., Inc., 4125-41 6th Ave. P. O. Box 703
Avoca: Lunox Chemical Works Inc., Box 7
Pittsburgh: Thomas Knoch 244 Bascom St.

RHODE ISLAND
Providence: T. H. Baylis Co. 42 Gano St.

TENNESSEE
Memphis: The Lilly Co. 406 Union Ave.

TEXAS
Big Spring: T & T Supply Company, Inc. 1380 East Third Street Big Spring Texas
Dallas: Chas. H. Platter & Co., Texas Bank Bldg. P. O. Box 5998
El Paso: George S. Thompson Co., Inc., 611-615 N. Campbell St.
Houston: Leatherwod Supply 2005 McKinney
San Antonio: Ryan Brokerage Co., Transit Tower

VERMONT
Burlington: Valcour Chemical Co., So. Champlain St.

VIRGINIA
Richmond: Phipps & Bird, Inc. 303 S. 6th St.

WEST VIRGINIA
Charleston: B. Preiser Co., Inc., P. O. Box 6118

WISCONSIN
Cottage Grove: North Central Chemicals, Inc.
Green Bay: Wisconsin Refrigeration Supply Co. 1016 Velp Ave.
Milwaukee: Benlo Chemicals 1907-25 S. 89th St.

Allied Chemical

First in Ammonia Since 1890

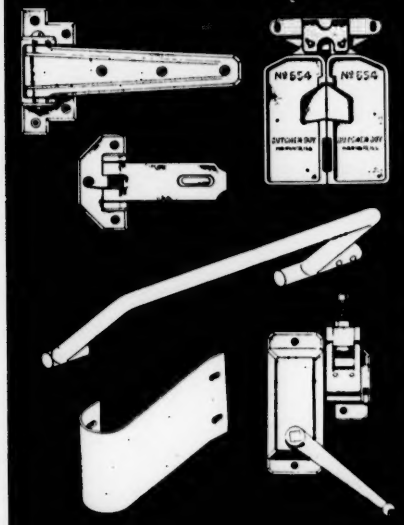
HOPEWELL, VA. • IRONTON, OHIO • ORANGE, TEX. • OMAHA, NEB.

NITROGEN DIVISION • DEPARTMENT CA 6-11-4 • 40 RECTOR STREET, NEW YORK 6, NEW YORK

"Butcher Boy"
Since 1885

Refrigerator Doors

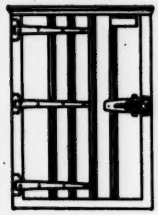
REFRIGERATOR DOOR HARDWARE



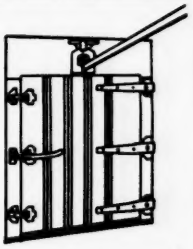
SAFETY RELEASE FASTENERS
No. 11 or No. 12
Permit opening from within even though padlocked from outside

CATALOGS AVAILABLE UPON REQUEST

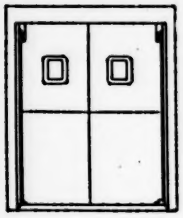
STANDARD COOLER-FREEZER DOORS



- Modern Streamlined Appearance
- 100% Douglas Fir Construction
- Massive and Durable Hardware



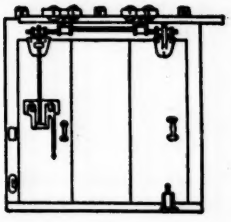
STANDARD VESTIBULE AND AUTO CLOSE DOORS



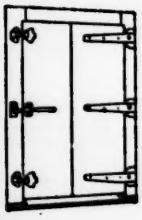
- Double Acting Doors for Loading Docks
- For Heavy Trucking Openings
- Save Refrigeration Losses

HORIZONTAL SLIDING DOORS

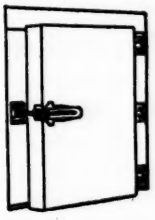
- Ideal where space factor is limited
- Recommended for Freezer Areas
- Available for manual, air, or electric operation
- Mechanically operated doors open and close in less than 4 seconds



LOW TEMPERATURE INFITTING AND SUPER FREEZER OVERLAP DOORS



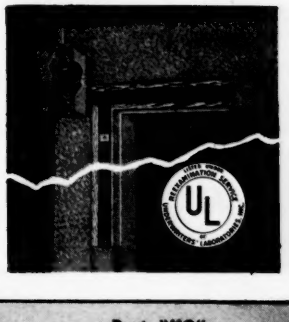
- Low Temperature Doors for +10 to —20° F
- Super Freezer Doors for —0 to —100° F
- Both types available with No. 51 electric defrosters
- Extra heavy duty hardware applications



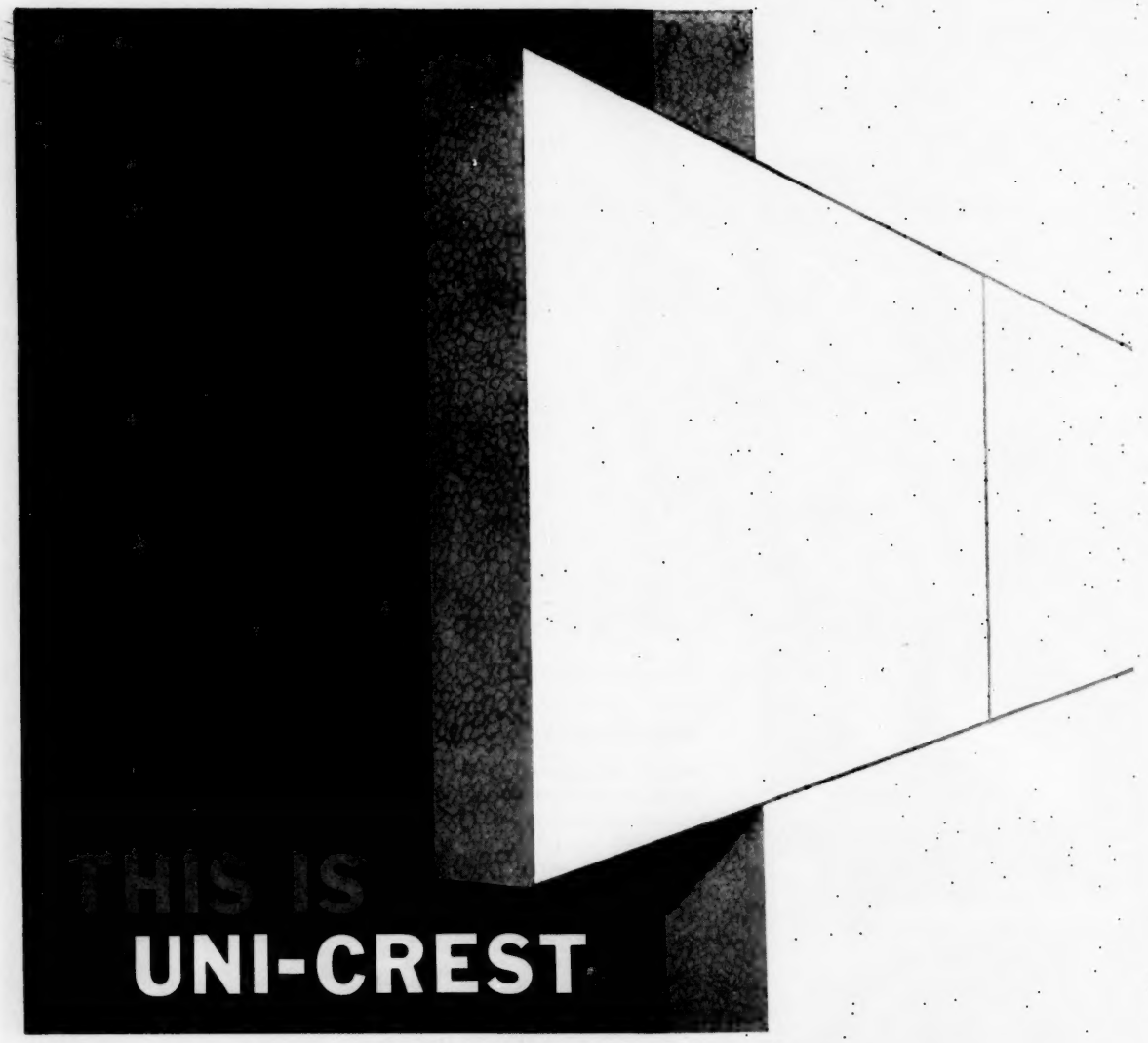
New!

FULLY AUTOMATIC ELECTRIC DEFROSTERS

- Underwriter's Approved—An exclusive First with Butcher Boy
- Flexible "silicon" covered (not lead covered) heater cables
- Furnished with calibrated "thermostat"—economical heat control



BUTCHER BOY REFRIGERATOR DOOR CO. Dept. "MG" HARVARD, ILLINOIS



a new foam plastic insulation of outstanding properties

Uni-Crest is an extremely lightweight homogeneous white material with a smooth, tough surface. It is composed of minute, individually closed cells, produced by expanding beads of polystyrene. The inherent properties of Uni-Crest make it an excellent low temperature insulating material.

Uni-Crest has a low K factor (thermal conductivity) and retains its insulating value indefinitely. Lightweight, strong, flexible, it has excellent bonding characteristics, is non-dusting and non-flaking, and can be cut and handled easily. Uni-Crest is inexpensive, too.

Write today for complete specifications and installation information on application of Uni-Crest to your specific problems. We will be happy to send you this, plus an actual sample of Uni-Crest.

UNI-CREST DIVISION UNITED CORK COMPANIES
Since 1907

4 Central Avenue, Kearny, New Jersey

UNITED UNI-CREST

Uni-Crest engineering offices or approved distributors are located in key cities coast to coast.

October, 1958

Number 4

Vol. 135

Industrial Refrigeration

Now in its 67th Year of Publication

H. T. McDermott
Editor and Publisher

J. R. Kelahan
Managing Editor

H. D. Busby
Associate Editor

ADVERTISING
O. Rhodius Elofson, *Director*
Edw. Davieson, *Representative*

Helen B. Smith
Secretary

E. P. Swanson
Subscription

V. S. Smith
Production

Official Organ
National Association Practical
Refrigerating Engineers

INDUSTRIAL REFRIGERATION, Vol. 135, No. 4. Published monthly at 433 N. Waller Ave., Chicago, Ill., U.S.A., by Nickerson & Collins Co. Yearly subscription in the U.S., $2.00 per year; other countries, $3.00. Single copies, 25 cents. Copyright 1958 by Nickerson & Collins Co. Acceptance as controlled circulation publication at Chicago, Ill., and Pontiac, Ill.

CHANGE OF ADDRESS—Notify publisher and your local post office promptly of change of mailing address to avoid non-receipt of copies. Copies incorrectly addressed, because of failure to notify publisher, cannot be replaced. Upon request, post office will provide, without cost, convenient "change of address" mailing cards.

Industrial Refrigeration is indexed regularly by Engineering Index, Inc., and is microfilmed for library use by University Microfilms.

Contents

Refrigeration Serves National Defense 8
Strategic air and sea control by aircraft is a large factor in the present U.S. defense plan. Large tonnages of low temperature refrigeration determine the air-worthiness of the B-58.

Growth of Industrial Safety 12
Safety and fire prevention are related. In October the nation observes National Fire Prevention Week, and the National Safety Council meets at Chicago. Ten years of emphasis have seen great improvement in occupational safety. Fire prevention on the other hand can stand improvement.

Renewed Activity in Refrigerated Warehousing 14
Personnel changes of international consequence have taken place recently in the refrigerated warehousing industry. There is also upsurgence of construction both public and private in the U.S. and abroad.

Loxygen 17
Liquid oxygen is gaining in popularity for processing. Used as an oxidizer in such hard materials field as steel.

Ebullient Engine Cooling 18
New ebullient solutions and eutectic fluids introduced at the Power Show; now designated as thermal liquids, they will probably have some immediate influence in the industrial refrigerating field.

Railroad Reefer Tests 28
USDA reports on an 11 railroad car transcontinental test involving a comparison of mechanical and water ice reefers.

More Radiation Claims 30
Chemical Society Meeting at Chicago prompts more claims.

Refrigerated Scow 32
Alaska canners put into operation largest seawater chiller.

Departments

News Briefs	4	Book Reviews	29
What's New	7	Industry Meets	31
Question Box	20	Personnel News	41
NAPRE	26 and 34	Manufacturers' News	42

The Cover:

COVER pictures the Cosmotron at Brookhaven National Laboratory, Upton, N.Y. Large 60-ft diameter doughnut is the magnet. Three units adjacent are vacuum pumps. Concrete blocks in the foreground are high energy atomic ray particle shield for operating personnel. Refrigeration cools the magnetic field. For further details of this application see "Cosmotron", page 27.

Published Monthly by NICKERSON & COLLINS CO.
General Offices: 433 N. Waller Ave., Chicago 44, Ill. Teles.: AUstin 7-1303-04-05

news briefs of the month

Changes Recommended In Poultry Records

NARW has recommended to USDA that some changes be made in the proposed record-keeping requirements for public refrigerated warehouses. The proposed revisions are to the Poultry Products Inspection Act. The principal objection by the warehousemen is to the ninth item which would require them to take license numbers, ICC registry numbers and other identifying features, thereby imposing additional work.

Consumer Apathy Cuts Frozen Meat Line

Several sources have reported that Armour & Co. have discontinued production of frozen meats for retail sale, and Swift & Co. reduced their line from sixteen to seven basic cuts. One of the packers indicated that slow movement of the frozen product was the cause of their disinterest. A super market operator however, indicated it was customer apathy toward the expensive cuts prepared.

More Central Stations For Los Angeles Institutions

In August, Los Angeles County opened a central heating and refrigeration plant at the Civic Center. In September, they announced construction was under way for a central heating and refrigeration plant and a laundry building for the Los Angeles County Harbor General Hospital at Torrance. M. A. Nishkian & Co., consulting engineers, have also prepared plans and specifications for this second project. Another boiler-refrigeration plant was announced in July for the Mira Loma Sheriff's facility, another Los Angeles County installation.

Western Crop Failure Cuts Maine Railroad Revenues

The Bangor and Aroostook's fleet of 1200 refrigerator cars is coming home from trans-continental service a month earlier than usual because adverse weather has cut the production of West Coast lettuce, citrus fruits, grapes and vegetables. Normally, these cars would operate as part of the pool of the Pacific Fruit Express Co. for another thirty days and would have done so this year had the Coast not suffered what has been described as the "worst season in twenty years".

50-Year Machine To St. Louis Museum

Carling Brewing Co. has donated a large 50-year-old steam powered refrigeration compressor to the Museum of Steam and Marine Engineering at St. Louis, Missouri. The 82-ton unit, installed fifty years ago in the old Hyde Park Brewery, is said to be the finest addition received at the Museum. The machine was nearly three stories high and was still in operating condition when it was dismantled and moved to the Museum. One of the brewery walls had to be removed in order to make the transfer.

Census Bureau Asked To Include Grocery Reefers

Another recommendation made recently by NARW to the Census Bureau, USDC, is that refrigerated storage space operated by grocery chains, be included in the next report of refrigerated warehouse space. At present, it is not included in USDA statistics, although this space is an industry factor.

Refrigerants Numbering Proposed to ASA

Halocarbon refrigerants, previously described by various producers in a number of trade names, can be more simply expressed as Refrigerant 12, Refrigerant 22, Refrigerant 114, etc. This is the number designation made by ASRE to the American Standards Association. Currently, ASA is circulating the proposal to other groups, societies and associations for approval. Among the groups are NAPRE, RSES, ASHAE, etc.

DRYNESS

best reason in the world for specifying

genetron®

SUPER-DRY REFRIGERANTS

In "Genetron" Super-Dry Refrigerants, moisture has been reduced almost to the vanishing point. "Genetron" 12, for example, has less than one-thousandth of one per cent of moisture! And the tight quality "specs" for "Genetrons" are usually *bettered* in production. "Genetron" Super-Dry Refrigerants are available from wholesalers everywhere. So be sure to make your next order—"*Genetron.*"

QUICK FACTS on GENETRON Super-Dry Refrigerants

- Guaranteed exceptionally low moisture content.
- Noncorrosive to standard equipment materials, nontoxic, nonflammable, stable, safe.
- Critical and freezing points well outside range of operating uses.
- Solvent action on oil helps prevent solidification or congealing of lubricant; aids in lubrication of equipment; generally miscible with oil.
- Freely interchangeable and may be mixed in any proportions with comparable fluorinated hydrocarbons meeting the same strict refrigerant specifications.
- Available everywhere, from refrigeration wholesalers throughout the country.

GENETRON 11 ORANGE LABEL CCl_3F
Trichloromonofluoromethane

GENETRON 12 WHITE LABEL CCl_2F_2
Dichlorodifluoromethane

GENETRON 22 GREEN LABEL $CHClF_2$
Monochlorodifluoromethane

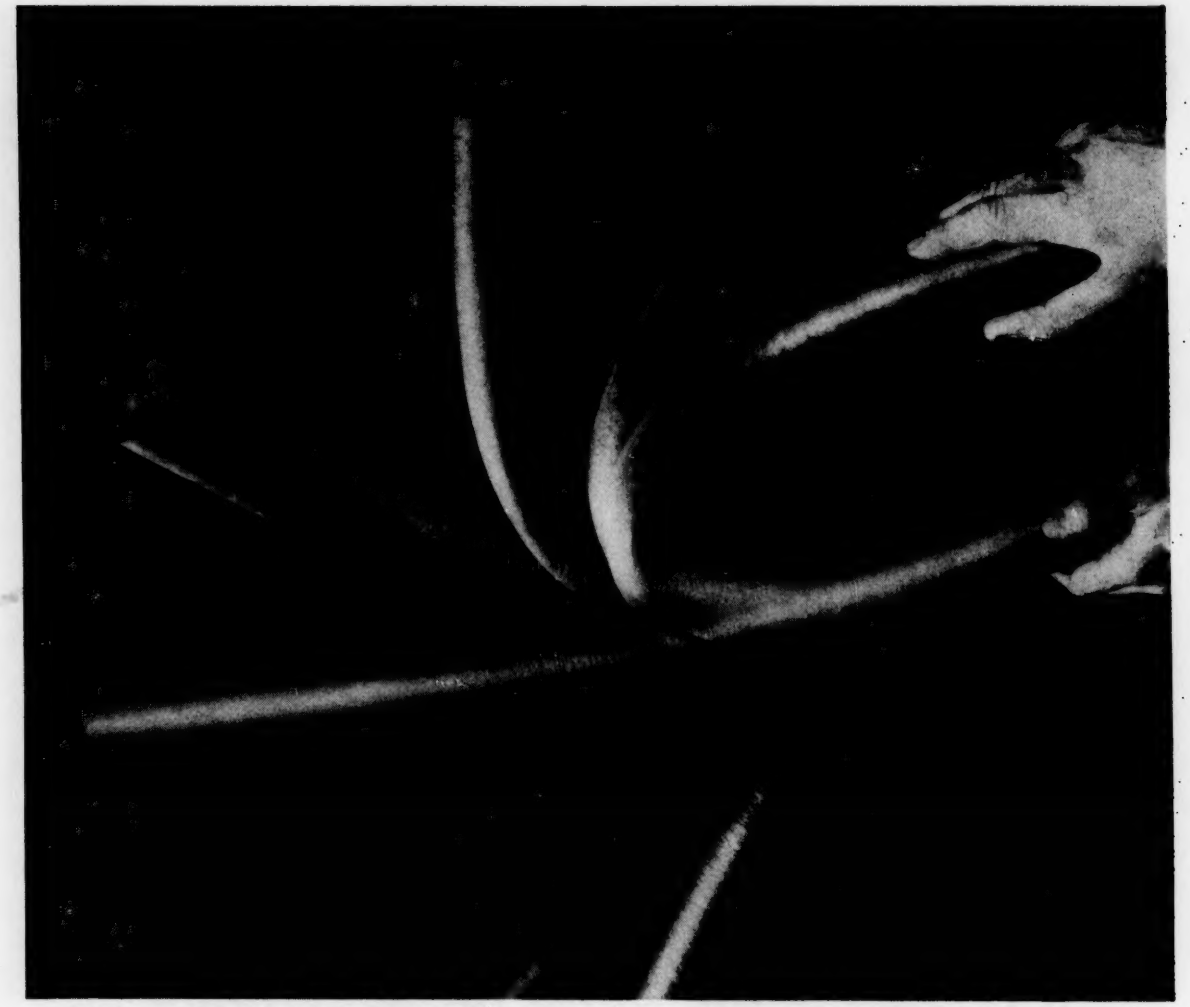
GENETRON 113 PURPLE LABEL $C_2Cl_3F_3$
Trichlorotrifluoroethane

GENETRON 114a BLUE LABEL $C_2Cl_2F_4$
Dichlorotetrafluoroethane

Allied Chemical

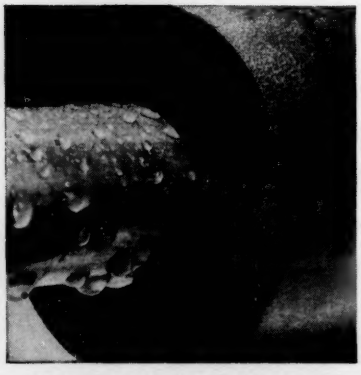
GENERAL CHEMICAL DIVISION

40 Rector Street, New York 6, N.Y.



Armaflex is extremely flexible, follows contours of piping or tubing without special cutting.

Highly flexible Armaflex pipe covering goes on fast, cuts labor costs in half



Highly efficient, Armaflex stops condensation on refrigeration and air-conditioning lines. Its closed cell structure completely seals out air and moisture.

So flexible it can be tied in knots, Armaflex pipe covering helps speed the insulation of fluid cooling lines. It reduces labor costs as much as 50% compared with the cost of applying conventional insulations to pipes and fittings. Armaflex can be slipped over pipe or tubing before connections are made. It follows contours readily. Or, the covering may be slit lengthwise, snapped in place, and cemented at the joints. Fitting covers are quickly fabricated from miter-cut pieces.

Made of foamed plastic, Armaflex has a closed cell structure that seals out air or moisture. No separate vapor barrier is needed. Armaflex is an unusually efficient insulation with a k-factor of 0.28 at 75° mean temperature.

Because Armaflex now comes in three wall thicknesses — 3/8", 1/2", and 3/4" — you can specify the economical amount* of insulation needed to stop condensation, or to save heat, on lines operating from 200° F. down to zero. Armaflex is available in 6' lengths and sizes up to 3" I.P.S. For larger piping, Armaflex sheets are used.

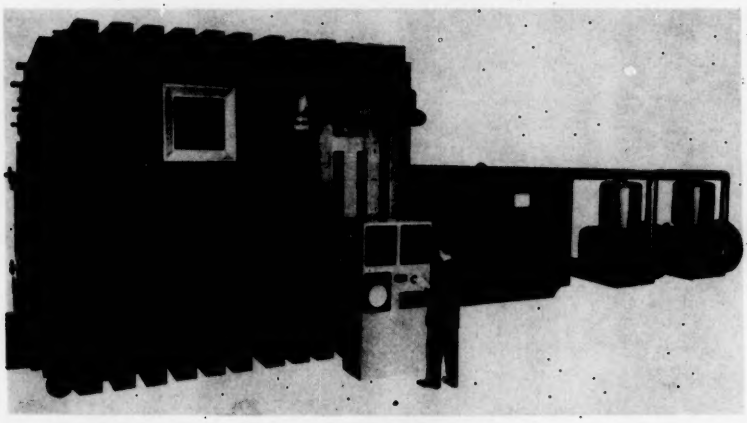
* Recommended Armaflex thicknesses for various service conditions are contained in a free descriptive booklet. For your copy, write Armstrong Cork Company, 2210 Skye Drive, Lancaster, Pennsylvania.

Armstrong INSULATIONS

What's New

MACHINERY
APPLIANCES • PROCESSES

Low—Temp Research Gains Momentum Dominates New Equipment Offers



▶▶▶ FEATURES in this issue of INDUSTRIAL REFRIGERATION bring out the importance of environmental testing, not only in our national defense effort, but also in connection with surface transportation facilities and various building materials. Low temperature equipment is becoming more and more essential to the American manufacturing production laboratory and low temperature products are being used on larger scales in a number of manufacturing processes where they had never been heretofore.

Canadian Competition

▶ RESEARCH testing in high-low temperature chambers is not exclusive with American test firms. Earlier in the year a Canadian research firm installed a 3x3x8-ft long cabinet for testing components in a range of temperature from minus 100 F to 300 F. Low temperatures were obtained by using a 35 hp compressor, high temperature fom a 9 kw heating element. The chamber was manufactured by a Holland, Michigan firm and cost of the laboratory $24,000.

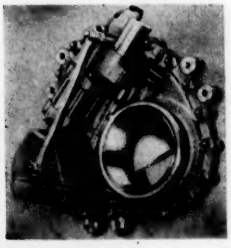
Nitrogen Generator

▶ OIL-FREE liquid nitrogen can be produced in a laboratory in amounts exceeding 4 liters per hour at approximately 18½ cents per hour, according to literature describing the Norelco Liquid Nitrogen Generator. Start-up time requires only one hour before liquefaction begins and can be continuous for 24 hours before defrosting is required. Defrosting is said to take half an hour and power requirements 9 kw at 220/440 volt, 3-phase. Water requirements are approximately 4 gpm at 20 psi, 85 F. The generator weighs 835 pounds but occupies floor space of only 2x6-ft. Cost is in the nature of $16,500.

Walk-In Altitude Chambers

▶ WHAT IS BELIEVED to be the largest prepackaged walk-in altitude chamber ever built, was assembled, tested, delivered in sections and reassembled at midyear. Built by a Farmington, Connecticut firm, this chamber must reduce pressure to a simulated altitude of 200,000 ft in seven minutes. The temperature range is from minus 100 F to 200 F and higher. Internal vibration, a test requirement, is provided at all temperatures and altitudes in a free test space of 12x12x10-ft. high, the unit pictured above.

Visualize another test chamber by this same firm, meeting same specifications with the exception of size. Latter chamber is 12x25x15-ft high, large enough for testing apparatus right on the trailer on which it is delivered.

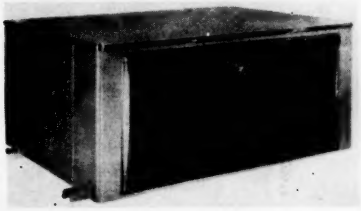


Cryogenic Valves

▶ GATE VALVES for handling liquid oxygen and other cryogenics are now available from a Dayton, Ohio firm. Utilized on line pressures up to 60 psi, they are designed for ambient temperatures ranging from minus 320 F to 250 F. Used for handling of standard aircraft, missile fuel and oxidizers, the valve actuation is accomplished manually, electrically, hydraulically or pneumatically.

Conventional Lines

▶ FOOD PRESERVATION still requires large tonnages of refrigeration, and also takes the quantity production from many major refrigerating equipment manufacturers. Also, accessory manufacturers are finding it profitable to continually improve and turn out new products for the food processing, distributing or retailing trade. A few developments in the past three months are given below.

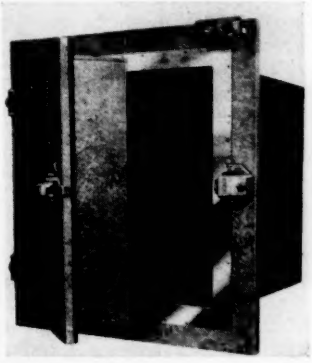


Adaptable Conditioners

▶ DEVELOPMENT of two larger sizes of room type air conditioners for low cost cooling of markets, restaurants, hotels and institution meat cutting rooms are announced by a Chicago firm. Two new units have capacities of 7½ and 10 tons. These two additions increase the firm's series to five sizes available from 2 to 10 tons, all highly adaptable for floor installation, even though they are basically designed for ceiling suspension.

Package Passing Tunnel

▶ FIRMS which experience considerable heat gain (refrigeration losses) through use of the ineffective passing doors will be interested in a new low temperature package passing tunnel offered by the Jamison Cold Storage Door Co. Although introduced at the start of the year, and therefore on the market for some nine months, the door offers several features which will overcome losses experienced in ice cream manufacturing, frozen foods packing and processing operations, and in warehousing.



These deep tunnel doors provide an airlock for the packages and can be provided for use with conveyors—gravity, roller, power chain or power belt types. Refrigeration loss is kept at a minimum by means of an overlapped strip rubber curtain which keeps access minimum.

(Continued on Page 40)

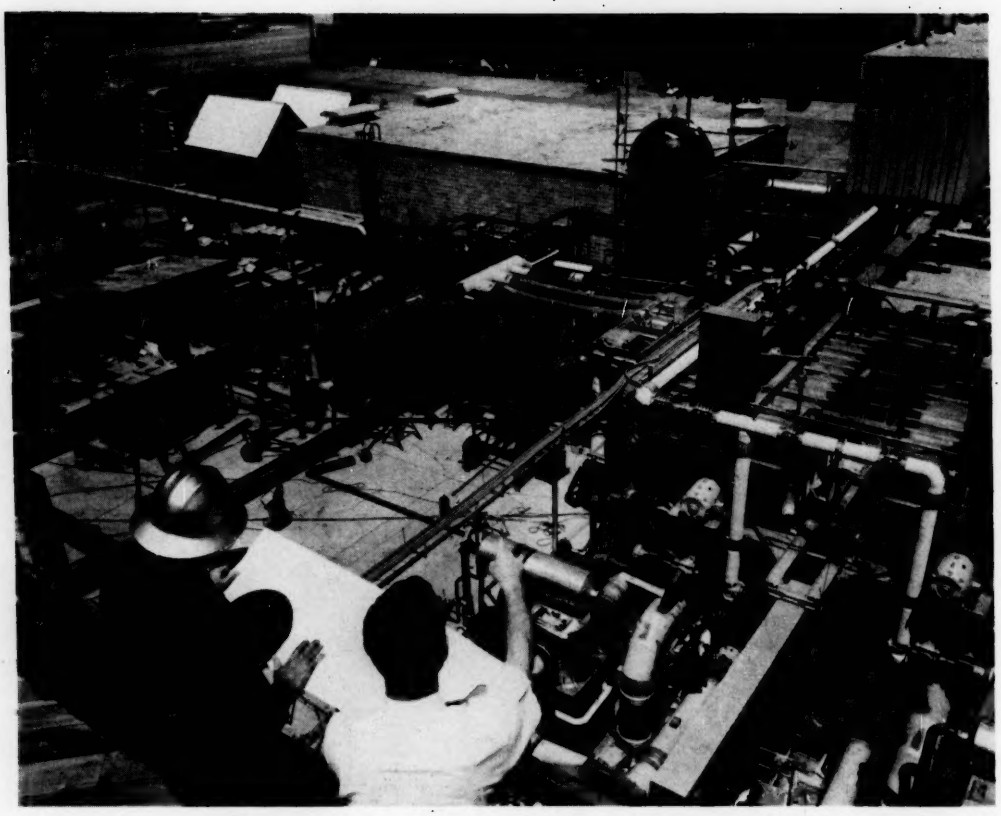


Fig. 1. This complex maze of equipment will enable Convair to test components, assemblies, systems and complex operational devices for such new stratospheric aircraft as the B-58 and the Convair 880. The high altitude laboratory pictured under construction simulates environmental conditions to 100,000 ft.

▶▶▶ MISSILES, today's concept of defense, use plenty of refrigeration, some aloft and most in ground support[1]. Mobile launching bases, surfaced or submerged, take less or more refrigeration, respectively[2]. And those concerned with development in this field tell the refrigeration industry it can contribute more.

While more glamorous, the supporting role of refrigeration in the latest defense emphasis, at best does not approach tonnagewise the environmental applications necessary to production of aircraft for the Strategic Air Command, U. S. Air Force; just one of the segments of the Defense forces. Environmental testing of the B-58 as related by A. Kuzmickey in April, was in a sense a testimonial to the importance of refrigeration, both mechanically produced and expendable refrigerant types. This presentation was given at the second annual meeting of the Institute of Environmental Engineers.

In June, J. D. Francis of the Worthington News Bureau described in greater detail the specific refrigeration application in the high altitude test cells for B-58 production.

Convair Installation

Reported in mid-summer as in final construction stages, were three high altitude test chambers for environmental proving of integrated assemblies and systems which make-up the B-58 Hustler. General Dynamics Corp., Convair Div. Fort Worth, Texas, is to use these chambers as a part of their high altitude laboratory.

Largest chamber of the three (30,000 cu ft exterior) is capable of temperature changes of minus 85 F to 400 F in 30 minutes, the two smaller ones in 10 minutes. All three will simulate conditions found at 100,000 ft altitude. Drop from ambient to low is accomplished in 30 minutes.

Three-Step Testing

Newest test chambers at Convair are the third part of today's concept of three-step testing. According to speakers at the Institute of Environmental Engineers' Second Annual Meeting, this three-step testing scheme involves a) testing of individual components and assemblies, b) testing of individual systems into which the components and assemblies are fabricated, and c) testing of combined systems in the extremes which will be imposed upon them.

Since components are the basic elements, all testing still starts with the simplest units. Examples of individual systems to be tested in aircraft construction are such things as the fuel system, control system and the air conditioning system. Combined systems tested involves simultaneous checking of systems grouped together in a large physical unit such as the aircraft cabin. Testing is done at ambient which is considered the rest state of the aircraft, and the high and low extremes.

---

[1]Refrigeration's Role in Missiles, INDUSTRIAL REFRIGERATION, August 1958.

[2]New Atomic Powered Submarine With Heavy Duty Cooling Systems, INDUSTRIAL REFRIGERATION, February 1957, Page 21.

In National Defense—

REFRIGERATION ALSO SERVES

Aircraft Enviroment Tests Use Large Tonnages

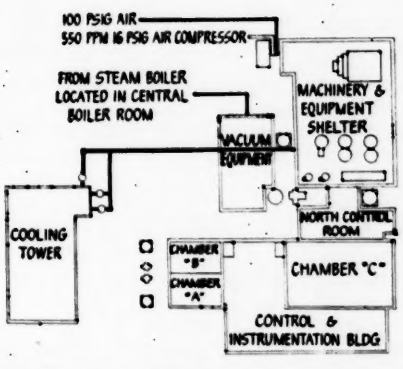


Fig. 2. Simplified plan of building arrangements and major machinery locations for the Convair high altitude laboratory at Fort Worth, Texas. View in Fig. 1 was made looking to the right from the cooling tower walkway.

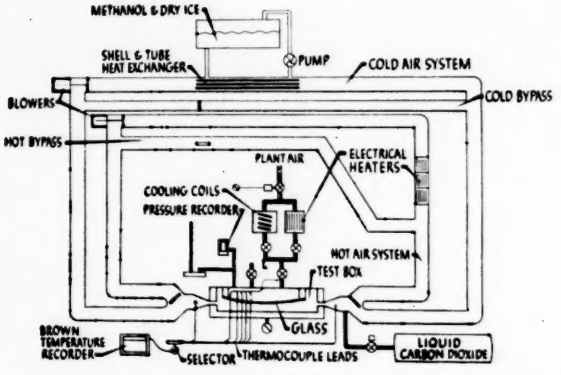


Fig. 3. Mechanical refrigeration is not always practical for short term testing. In testing the B-58 windshield, methanol and dry ice provide expendable refrigeration for one segment of test, while liquid carbon dioxide serves another.

Of necessity this third test stage is the largest not only in application but in the equipment required for producing test conditions. Fig. 1 is a view of the apparatus and of its associated piping and test cells that make up the high altitude laboratory at the Convair Division.

Third Test Increment

Installation of the three high altitude test chambers at Convair, marks the third major increment of environmental facilities for that aircraft builder. According to a spokesman for the firm, in 1944 the test facilities consisted of three small low temperature boxes for testing components. At that time the view of the industry was that component testing was adequate.

World War II showed the industry that component testing was not sufficient, that the systems must be tested as well. Production of the U. S. Army Air Force B-36 helped introduce larger environmental chambers in the temperature range of minus 100 to plus 180 F for such purposes.

With construction of the B-58, the industry had reached the conclusion that the temperature range and other simulated conditions desired would have to be expanded. Larger chambers were only a part of the answer. What actually evolved were full scale test laboratories and buildings. The three high altitude test chambers being completed, as mentioned, are only a part of the new laboratory technique. Figs 1 and 2 give the reader an idea of the buildings, the apparatus, equipment and controls involved in one laboratory.

Refrigeration Facilities

Today Convair employs six high-low temperature test boxes in addition to an impressive array of sand and dust chambers, fungus, humidity and salt spray cabinets, etc. An essential to production of an efficient and effective high altitude plane is windshield testing, only one example of a component which requires refrigeration in several forms. Fig. 3 shows windshield test setup.

Expendable refrigerants are used in two locations. Methanol and dry ice circulate through a shell and tube heat exchanger and provide a cold air source over the windshield surface when required for low temperature testing. Liquid carbon dioxide can be injected into the system for simulating other weather extremes, as well as for other purposes in the test set-up. On the opposite side of the glass, cooling coils are also used to simulate air temperature conditions as might be found in the plane's cabin.

Three major aircraft systems undergoing tests at Convair are fuel, hydraulic controls and air conditioning. The fuel system, quite elaborate, involves a physical test set-up similar and larger than that described in "Refrigeration's Role in Missiles"[1].

Air conditioning system tests were to assure the adequacy of the system. A B-58 cabin is simulated and installed in the test chamber. Five tests are conducted to determine temperatures of the cabin construction,

Two-Stage Vacuum, Three-Stage Refrigeration Utilities

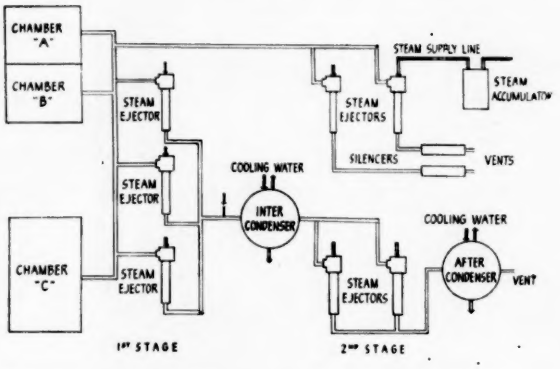


Fig. 4. Vacuum system in the high altitude laboratory is a 2-stage operation. Altitudes to 100,000 ft. are simulated within a matter of minutes. The system can be operated at the 2-stage level on 190 psig steam, and at partial operation with either 90 or 190 psig steam by venting to atmosphere. Ejectors, silencers are seen in center, Fig. 1.

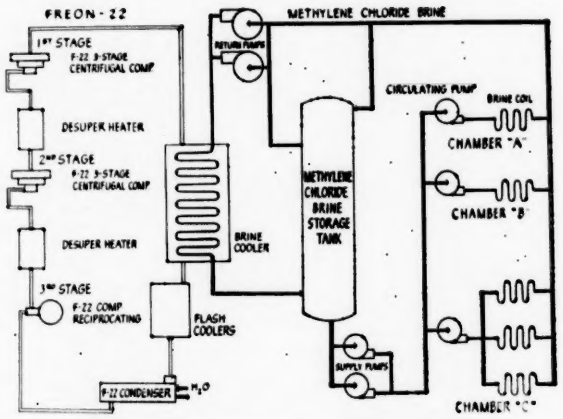


Fig. 5—Refrigeration system for the high altitude laboratory altitude is a 3-stage Refrigerant-22 brine chilling unit. The brine system in itself is a recirculating storage type, with complicated test cell supply.

cabin space temperatures and air velocities, noise level, duct data, and air diffuser requirements. In addition to cooling or heating loads imposed on the system from the atmosphere in which the plane is operated, and the customary human load involved in any air conditioning system, the B-58 airplane has the additional and unusual load dissipated from electronic devices.

The high altitude laboratory performs three tests for the aircraft builder. First of all it is used to check out the systems at room temperatures in order to obtain base line data. Then the various systems are integrated in the manner in which they are associated in the craft and then subjected to enviornmental test. One of the tests, that of simulated high altitude flights is dependent upon a 2-stage vacuum system. Fig. 4 outlines the vacuum system. In addition to the vacuum system, the laboratory is also equipped with compressed air and heat systems among other utilities.

Test Cell Construction

Referring back to Fig. 2, it will be noted that the high altitude test chambers are basically two in number. However, the smaller chamber is divided into two parts, A and B. The larger chamber is designated C.

Cell C is a clear work space of 50x35x12-ft, while the smaller chambers (A and B) total 20x35x12-ft. A sliding partition divides that chamber into the two equal sized cells.

Chamber construction is essentially the same as that described in "Inyokern Test Center"[3].

The outer shell is 9/16-in thick steel with 24- and 36-in. reinforcing I-beams spaced alternately 48 in. apart to withstand atmospheric pressure. Insulation is reflective type and the inner-liner is stainless steel. The customary features of full access doors that lower into the ground, observation windows, accessory panels, overhead crane, etc., will be found in the cells at Convair.

Operating Specifications

General requirements for the test cells is to maintain temperature between minus 100 F and 400 F at altitude conditions to 100,000 ft. In addition, any three of the chambers could control humidity (when required) at atmospheric pressure conditions in a temperature range of 35 to 185 F. The rh range is 20 to 95 percent. Rapid changes in altitude, temperature and rh take place with internal loads that also require substantial heating, refrigeration and evacuation capacity.

Refrigerating Systems

Two refrigeration applications serve the high altitude test laboratories. Refrigeration equipment serving all three chambers is in the machinery and equipment chamber (See again Fig. 2). A Refrigerant-22 3-stage system reciprocating compressor cools methylene chloride brine. The brine is circulated to points of use at minus 105 F. The schematic of the refrigeration system shown is Fig. 5.

Refrigerant-22 boiled off the brine cooler goes through its first compression stage in a 3-stage centrifugal compressor direct-driven by 115 hp steam turbine. The second boost of the refrigerant gas occurs in another 3-stage centrifugal unit, this one driven by a 485 hp steam turbine through step-up gears. Final compression stage is accomplished by a reciprocating machine direct-driven from a 200 hp motor.

Cooling between boosters and between the 2nd and 3rd stage is by means of desuperheaters equipped for liquid injection. Condensing of the refrigerant is by means of a water cooled shell- and tube-vessel. Somewhat unusual is a 3-stage flash cooler located between the condenser and the brine cooler for sub-cooling the liquid Refrigerant-22. The brine cooler is the shell-and-tube type.

The refrigeration system is equipped with the pump out and transfer system, and also with a purge unit. Turbines operate on 190 psig steam and exhaust into a single surface type condenser. Worthington supplied all refrigeration equipment.

Brine System

Brine was selected for use because of a "flywheel effect" which could be obtained in using a large brine storage tank in which the temperature of the secondary refrigerant could be lowered during non-test periods. The brine tank is located out-of-doors and holds 150,000 lbs of methylene chloride. It is pressurized with nitrogen to prevent evaporization under high temperature conditions.

Two brine pumps maintain circulation from the storage tank through the brine cooler and return. Two more

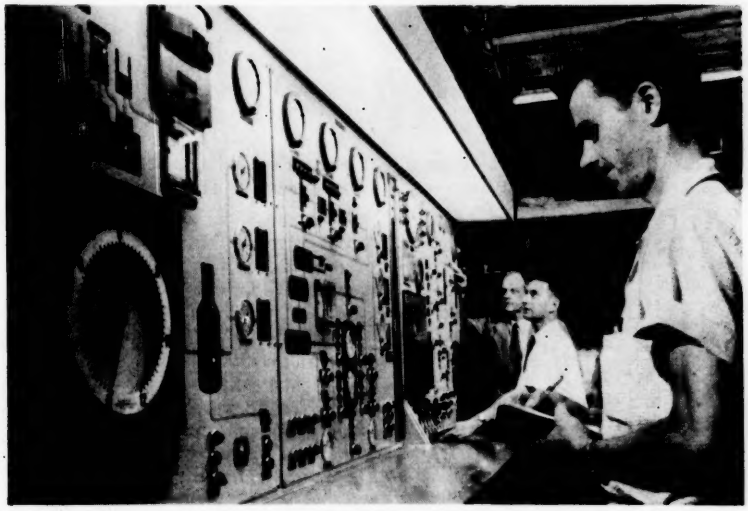


Fig 6. Major equipment supplying refrigeration, vacuum and high-pressure high-temperature air to the three test chambers are controlled from this single panel. Also, each chamber has its temperature, altitude and humidity controlled from its individual control panel located adjacent to the chamber.

pumps take suction from the brine storage tank and circulate the low temperature fluid through supply and return lines in the laboratory. Each test cell has its own pump which takes suction from the supply header and forces the brine through ceiling coils and back to the return mains.

Other Utilities

Each test chamber is provided with two types of heating equipment, because of the wide range of heating loads. Radiant electric heaters provide close control of chamber air temperature under high vacuum conditions. Gas fired heaters located outside of the chamber furnish high capacity heating.

As shown in Fig. 4, the test chambers are served by a central 2-stage steam jet evacuation system. Combined chambers A and B can be evacuated to 40,000 feet in one minute, 60,000 feet in two minutes and 75,000 feet in three minutes. One ejector uses 90 psig steam supplied from an accumulator and the remaining six ejectors require 190 psig steam. Cooling requires 8,000 gpm.

Serving the test facilities is a three cell induced draft redwood cooling tower of 10,000 gpm capacity. Two pumps handle the vacuum system and a third pump provides cooling water for all other equipment including the refrigeration system.

Compressed air requirements are supplied by 3-stage horizontal opposed steam driven air compressor delivering 550 ppm 16 psig air. A conventional 100 psig air source for instruments, cleaning, etc., is also available.

Control System

Described as completely automatic, the control system for the test cells (Fig. 6), includes indicating and recording instruments as well as controllers which maintain temperature, altitude and humidity conditions prescribed for the various tests. Each chamber has its own operating conditions regulated from the individual panels in the control and instrumentation building (see again Fig. 2). However, when chambers A and B are operated as a single combined chamber, controls of chamber B supersede those of chamber A, taking charge of the combined single test cell.

Outline specifications defining construction, performance, and control requirements were prepared by Convair's Plant Engineering Department at Fort Worth. Design engineering and construction of the building project was by Arthur E. Magher Company, Inc., New York City.

---

[3]Inyokern Test Center Produces Climatic Changes at Rocket Speeds, INDUSTRIAL REFRIGERATION, January 1958, Page 13.

Dry Ice Explosion

▶▶▶ MIXING dry ice and water is not recommended even for experts. An eleven year old Denver boy was injured over the Labor Day holiday when he mixed dry ice and water in a glass jar and then shook the mixture to see what would happen. He was in good condition after treatment in Denver General Hospital.

Jet Tests Prove Engine Operative In Hailstorm

▶▶▶ HAIL TESTS were performed on the 10,000 lb. thrust CJ-805 jet engine at General Electric's Aircraft Gas Turbine Division, Evandale, Ohio, demonstrating that the jet engine can operate in the most severe hailstorms likely to be encountered in commercial airline operations. The CJ-805 will power Convair's 880 jet transport. Test conditions are well above established requirements of withstanding 1-1/4-in. iceballs at 495 mph at full power.

An operating test engine survived hits with 1-1/4-in. iceballs at iceball speeds of 637 mph. Power setting included maximum engine rpm. With 2-in. iceballs, the CJ-805 survived hits at speeds up to 378 mph. Closed inlet vanes (most vulnerable position) withstood hits by 1-1/4-in. iceballs at speeds up to 600 mph and hits by 2-in. balls up to 440 mph. Struts and open inlet vanes withstood hits by 2-in. balls up to 624 mph and 529 mph, respectively, without any visible damage.

Dual-Use Fluids For Heating-Refrigerating

▶▶▶ ORGANIC chemical fluids which exhibit physical properties resistant to radiation and thermal damage were announced recently by Monsanto Chemical Co.'s Organic Chemicals Division. The nine fluids, five of which are available in commercial quantities, are polyphenyl compounds and certain alkyl derivatives. Polyphenyls are known to be one of the most stable classes of organic chemical compounds.

By alkylating pure polyphenyls and by developing eutectic mixtures of them, the company has obtained an increased range of fluidity and improvements in both low temperature and high temperature properties of the fluids. According to Monsanto, several of the fluids are currently being evaluated as coolants for nuclear power reactors.

Inert Liquid Coolant

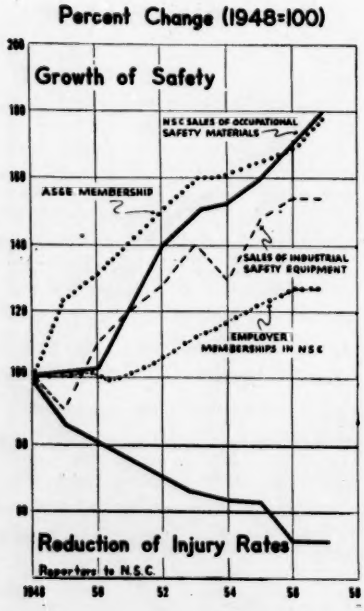
▶▶▶ HIGH POWER transmitting tubes are now cooled by fluoro-liquids. The NEW YORK JOURNAL OF COMMERCE reported recently that the Chemical Products Group, Minnesota Mining and Manufacturing Co., is producing this practical low temperature coolant which is twice as effective at near freezing temperatures than the water cooling system previously used for transmission cooling.

Growth of Industrial Safety

▶▶▶ MEETING in Chicago on October 20-24, the National Safety Council, will, among many items of business, review and evaluate the past ten years of occupational safety. Earlier in the month, October 5-11, the nation will observe Fire Prevention Week. That observation provides an excellent opportunity for all refrigerating firms to survey their fire protection apparatus and review their fire fighting practices. It should also prompt a re-evaluation of disaster procedures by plant safety committees. Disasters and fire too frequently go hand in hand.

David L. Arm, Manager, Industrial Department, National Safety Council, in "AN EVALUATION OF OCCUPATIONAL SAFETY EXPERIENCE," sounds a caution on a tendency to relax safety measures. Because safety is good business, says Arm, for both humanitarian and economic reasons, constant strengthening of organized safety efforts must occur. While this is true in good economic periods, it is especially true during business recessions.

Safety does not cost money—it saves money for both employer and employee—and the wise business man will improve, rather than curtail, his safety programs during periods of economic stress, according to Arm. Employment is now somewhat lower than it has been. If safety programs are allowed to relax and records are allowed to become worse, the lost ground must be regained at the time of a great influx of new workers—the worst possible time, according to this NSC representative.



—Courtesy, National Safety Council.

Literature Plentiful

Literature both on fire prevention and safety programs is available to the industry from many sources. The NSC thru various industrial group committees, sponsors and promotes newsletters, bulletins and literature which review safety programs and encourage great effort on the part of members and non-members alike. In the fire prevention field, much literature is available from organizations like the National Fire Protection Ass'n.

Casualty insurance firms, like the Hartford Steam Boiler Inspection and Insurance Company, not only offer their services in the promotion of safety and fire prevention, but thru publications circulated to the owners and operators of boiler and power machinery, both prospects and insureds alike, they render an alerting service. THE LOCOMOTIVE, for example, a publication by the Hartford firm, relates case histories, pointing out the cause and effect, and suggesting preventive measures for others. State industrial commissions, like those in Florida and California, not only render statistical service (and in some cases even exercise regulatory powers), but they publish disaster reports and safety manuals for the guidance of machinery operators. Trade associations, such as National Association of Refrigerated Warehouses, publish regular bulletins in the interest of continuous safety promotion among their members.

Fire Losses Rising

In spite of a seemingly unlimited journalistic effort on the part of such groups, accidents continue to occur and millions of dollars of property goes up in smoke annually. The NFPA reports industrial and mercantile fires in excess of 70,000 per year, with losses close to 200 million dollars. Ammonia explosions and refrigerant derangements continue to occur, even with the more than usual emphasis placed on these items for the past year in the trade press, which lends its weight also to the safety effort.

Casualties Decline With Increased Safety Emphasis

Encouraging, was the report by David Arm at the President's Conference on Occupational Safety in March. The chart accompanying this article entitled Growth of Safety, is based on his report and a number of accompanying illustrations. He compared the increase in safety activities by the members of the National Safety Council and American Society of Safety Engineers with a reduction in injury rates during the past 10 years. As safety activity goes up, injury goes down.

In an advice to the National Association of Practical Refrigerating Engineers, last Fall, A. R. Carstensen, Chairman, NARW Safety Committee pointed out to the practical engineers that while their frequency rate had declined in accordance with the aforementioned statistics, the severity rate was still quite high. Judging from accidents reported this year to INDUSTRIAL REFRIGERATION these remarks would still hold true. The engineers are conscious of and tend to observe safety and fire prevention measures, but the accidents and fires that have occured have been far from minor in a number of refrigerating plants.

Disasters Cited

In one midwest cold storage plant, ammonia escaped from a refrigeration system while an engineer was draining oil from an accumulator in the engine room. The engineer was seriously injured and a number of firemen were affected by the refrigerant during rescue operations. Another engineer, following safety practice established by the company, secured the king valve on the refrigerating system which probably prevented the escape of still more refrigerent, health risk to more employees and firemen, and reduced hazard of explosions.

The refrigerated warehouse industry is not alone in refrigerent derangements this year. Rupture of a vessel in a seafood plant late in August sent 30 women employees to the hospital, along with the engineer's three workmen.

In the transportation field, a break in hose between delivery truck and storage tank permitted fumes to spread over a ten block area on the West Coast, sending 67 persons to hospitals and first aid establishments for asphixiation and burn treatment.

Fire Prevention:
Partner To And Direct Support Of Safe Practices

Associated Press reported that every pet dog, cat and bird in the immediate area died.

In the South East, opening of a chiller in a plastics plant released refrigerant which resulted in two deaths and eight hospitalizations.

Firms in the industry are urged to review again their disaster procedures with special emphasis this month on fire and explosion hazards. Obtain copies of the ASA-ASRE B 9.1 code. This standard which is available at $1.50 a copy, gives the ventilation requirements for engine and machinery rooms employing various types of refrigerants. Piping and pressure vessel requirements are also included.

During August, the NARW circulated "Ammonia Safety Notes," reprinting in part from publications of the Manufacturing Chemists Association of the U. S. Every safety or plant disaster committee should have copies of that bulletin, but most of all should have the personnel protective equipment which this four page bulletin lists along with engineering instructions, first aid and medical treatment.

Fire Prevention Material

Literature for assistance to plant fire protection and/or safety committees can be obtained from NFPA. One excellent folder is entitled "Don't Burn Up Your Pay Check". It lists what every employee must know, setting forth 12 specific boners commonly pulled by plant personnel. Winding up this publication, the authors point out that a good job followed by a bad fire results in no job!

A self inspection form for industrial plants is available from the NFPA at $1.00 per hundred. High on this self inspection form is Maintenance, but it is preceded by Cleanliness and Order. Employees as well as management have a responsibility for plant good housekeeping.

Electrical Hazards

Although October is generally reserved for fire prevention effort, it should be noted that occupational deaths reported in 1957, by Florida and several other states, listed a greater number than usual occuring from electric shock. There is a direct tie-in of contributing causes in electrically caused deaths and the national fire prevention effort. Lack of proper maintenance and carelessness in operating electrical apparatus which brought about this category of death increases, is also responsible for fires. Many times a fire followed an accidental death due to electric shock.

The Florida Industrial Commission is not only circulating standards for electric safety to all industrial plants, but have published and circulated a Safety Manual for The Guidance of Operators of Ice Manufacturing Plants. One of the major sub-headings of this manual deals with electricity and the State Safety Code requirements for this form of energy, as well as electric operated portable tools.

Adapt New Materials—Methods

Safety not only calls for compliance with codes, review of case histories and actual practice of safety and fire prevention measures, but it calls for adaptations of modern devices. Most often the necessity of a certain type protection stimulates such applications. As an example, the village of Schruns in Austria experienced death dealing avalanches. Today, a fence of aluminum strips erected in such a way it reflects the sun and melts the snow in certain critical areas, has been built near the village.

If members of plant safety or disaster committees have new ideas for reducing certain hazards, those ideas should be reviewed by a safety engineer and if found practical, employed. Further, such ideas should be passed along to the safety committee for the firm's particular association, in order that others may apply the idea to save a life and possibly a dollar.

More Timely Material From NARW Committee

▶▶▶PROBABLY anticipating the need of its membership for a timely review of fire prevention practices, the NARW Warehouse Operations Committee issued their Ideas bulletin in July on the subject of fire dangers. Specifically the bulletin dealt with fire dangers during construction and repair periods. Some eleven cautions and remedial suggestions were offered.

IR Offers Reprints

▶▶▶Recent articles published in INDUSTRIAL REFRIGERATION may be helpful to the plant disaster or safety committee:

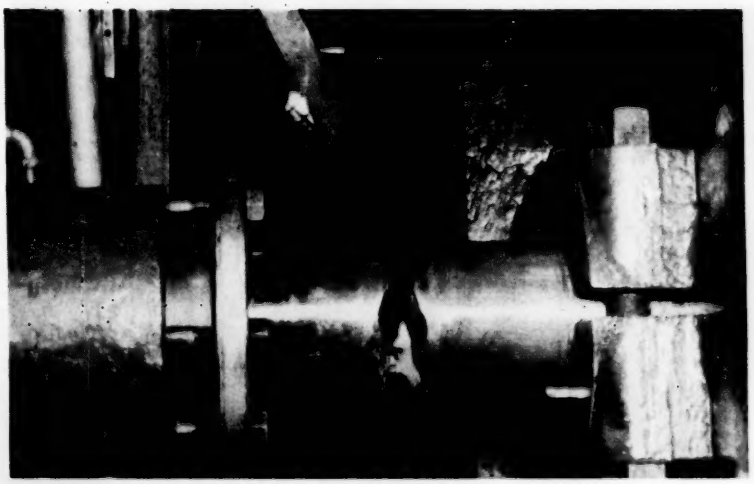
"How Dangerous is Ammonia?"
By K. M. Holaday

"Surviving and Preventing Disasters"
Staff Written

Reprints are available as follows:

Single Copies.....50¢ each
Ten or more copies.....25¢ each
One Thousand lots.....10¢ each

Write Reader Service Department, IR.



Your Safety Committee Encourages Periodic Machinery Inspections?
Break shown is main shaft of ammonia compressor in a hotel. Located between packing gland and fly wheel it developed from a progressive crack; apparently originated less than 7 months before failure. Bearings had burned out after oil line failure and the shaft was tested for cracks at that time.

—From The Locomotive of the Hartford Steam Boiler Inspection Co.

Refrigerated Warehousing Industry

ACTIVITIES STEPPED UP WITH PERSONNEL CHANGES, CONSTRUCTION

▶▶▶MOVING into the harvest season, cold storage activities normally see an increased tempo. However this year numerous changes in personnel, especially at the leadership level, has focused considerable attention again on the industry. Construction, somewhat slow in the past year and a half, has picked up again in this field.

New NARW Executive

Announced late in August, was the appointment of a new Executive Vice President for National Association of Refrigerated Warehouses, Inc. He is **Richard M. Powell,** succeeding William Dalton who had become President of ARI. The news was released by NARW President Philip G. Kuehn.

Powell assumed his new duties on October 1. He had been Managing Director of the National Institute of Rug Cleaning since 1950. A veteran, Powell had served in the Air Force during World War II as a pilot. He left his active duty status as Lt. Colonel and commander of his squadron. A native of St. Paul he is a graduate of Carleton College, is married and father of two children.

Foundation Changes Hands

Dr. **Walter A. Maclinn** is the new Director of The Refrigeration Research Foundation, a non-profit Corporation initiated and sponsered by NARW. The former director and secretary, H. C. "Dutch" Diehl, retired on September 30. Announcement of his replacement came from Garth A. Shoemaker, President, TRRF. A Selection committee empowered by the Foundation's Executive Committee filled the post of Director.

Most recently Chairman, Department of Food Science, Rutgers University, Dr. Maclinn has been a Professor since 1946 and a research specialist. In introducing him to the membership, the Dr. conveyed this message thru TRRF's President: "It is my impression that Dutch is a frend to all of you. Certainly, through your help, he has made The Refrigeration Research Foundation a sound and useful institution with a worldwide reputation. By guidance from you through your Board of Governors and your Executive Committee, we should be able to maintain its usefulness, and, given time, I hope to earn your friendship."

Dr. Maclinn made his home in Dunellen, New Jersey with his wife and two children, where he was also Assistant Health Officer and a member of the Board of Education. A graduate of the University of Massachusetts, he obtained a Master of Science degree at both his Alma Mater and Oregon State College, also acquiring his PhD at Massachusetts in 1938. His field of specialization has been chemistry and microbiology of foods, quality retention, and associated fields of math and physics.

Research Builder

Entering military service as a 2nd Lt., Maclinn was one of the first officers assigned to the Food and Container Research Institute, Chicago. Ration development and improvement were his assignments under Colonel R. A. Isker, CO. He later became Executive Officer and Assistant Director, separating from the service as a Major.

At Rutgers University, he was authorized to initiate a program of reseach and teaching in food science and technology. From a beginning of no facilities or personnel, his department progressed to a staff of five professors, six technicians, eighteen graduate students and an annual operating budget of $70,000.00. Today, the department has an equipment inventory of $100,000.00, all housed in a remodeled building which serves as pilot plant, labs and office.

Diehl Directs TARS

Trans-American Refrigerated Services, Ltd., is now under the managing directorship of **H. C. "Dutch" Diehl,** since 1943 the Director of TRRF. His appointment by the TARS Board of Directors, was announced by Lowell E. Kern, President, effective October 1. He will maintain TARS executive offices at Colorado Springs, Colo.

TARS, although established two years ago by a group of independent warehouse companies, first broke into the trade press a year ago June with an announcement of its membership and two basic objectives. These objectives cited were the development and maintenance of refrigeration practices of the highest standards through scientific research and improvement of operating procedures; and, to reestablish the refrigerated warehouse as an integral and essential link in the modern food distribution chain. Member companies of TARS work together nationwide to provide an adequate storage and distribution service to large packers and retail organizations.

Practical Applicator

According to TARS' President Kern, who is Executive Vice President of Terminal Ice and Cold Storage Company, Portland, Oregon, one of the six member companies, Diehl is not only well qualified to serve TARS in his new capacity, but sees a new challenge and opportunity to put into practice the scientific research and practical work to which he had contributed prior to and during his fifteen years as Director, TRRF.

Diehl is considered a pioneer in frozen food research. He entered the industy in 1920, established the U. S. Laboratory in Seattle in 1932 and was late Divisional Chief, WRRL (now WURL) Albany, California. In 1943, he was selected as Director, TRRF.

Author of many government publications and reports, professional articles published in trade journals, he has been honored many times for his practical approach and presentation of research facts for industrial useage. Latest honor conferred on him was a fellowship in ASRE and prior to that was a Doctor of Science degree from the University of Rhode Island, 1957. "Dutch" has been a member of NAPRE for nearly 20 years, always willing to lend a hand at guiding the practical engineer. "Dutch" married Cecelia A. Maurer in 1920 and has five children.

Currently serving as a Vice Chairman of the U. S. National Committee for the International Institute of Refrigeration, Diehl is secretary of the Institute's Commission for Foodstuffs. He is Vice Chairman of two USDA

Powell

Maclinn

Diehl

tasks forces and advisory committees and is a consultant to WURL and Quartermaster General. In 1957, he served on a special by-partisan commission on appointment by President Eisenhower and has also served on the National Academy of Science Committees. He has also served as President of IFT and was Vice President, ASRE.

Other Personnel Changes

Charles L. Henry is now Vice President and General Manager of Jefferson Warehouse and Cold Storage Co., Birmingham, Alabama. Henry was formerly Vice President of the Atlantic Co., Atlanta, Georgia moving to Birmingham with his family after sixteen years with the former firm. Jefferson Warehouse is a 180,000 sq. ft. facility, leased from the Birmingham Food Terminal and the Georgia Industrial Realty Co. by W. C. Hudlow, Jr. of Chattanooga, Tennessee. Hudlow operates the Chattanooga Warehouse and Cold Storage in that city.

Joseph "Sim" Smith a fruit industry veteran of nearly 50 years and a founder of Cashmere Pioneer Growers, Inc., retired in mid-summer. Smith came to the Wenatchee Valley (Washington) in 1910. Ten years later he became manager of a fruit company and later with five other growers, organized a waehouse company. He remains a Director of the company he founded in 1929, a 67 car storage.

New Brunswick Cold Storage Directors in August elected **George H. Baillie** of Toronto, President of the company. He is Vice President of the Canadian Pacific Railway, Eastern Region. Functions of the New Brunswick Company were taken over by CPR in 1910. Vice President of the Cold Storage Company, elected at the same meeting is **J. R. Strother,** also of Toronto. Strother is General Manager of CPR's Eastern Region. Other directors are N. R. Crump of Montreal, CPR president; F. E. Wolff, manager of the CPR Department of Immigration and Agricultural development; C. R. Wasson and H. H. McLean. McLean was also reappointed secretary of the cold storage company.

Start of the Fall school term found Major General H. R. McKenzie at San Francisco State College where he is now Professor of Industrial Management. He retired as Executive Director of Military Subsistance Supply Agency on July 1. He was succeeded in the MSSA post in August by Major General Hugh McKintosh.

Merchants Confirms Security Merger

Merchants Refrigerating Co., NYC, announced late in August the merger of Security Warehouse and Cold Storage, and Refrigerated Food Services, Inc. Announcement was made by Arthur N. Otis, President of Merchants. Effective September 2, Security plants at San Jose and Santa Clara, California, will be operated as Refrigerated Food Services, Inc.-Security Div.

Glenn F. Dodson has been appointed Vice President and General Manager of the new division. Security annexation expands Merchants' California operating properties in a Coast to Coast service. One of the largest refrigerated warehouse firms in the industry, Merchants owns and operates nine other warehouses in New York City and Buffalo, New York; Jersey City and Newark, New Jersey; Vinita Park, St. Louis County, Missouri; Hopkins, Minnesota and Modesto, California.

Thompson Restaurants Expand Frozen Lines

Chairman John R. Thompson, Jr. of the Chicago restaurant company of the same name, announced in mid-March this year that the firm needed prompt expansion of plant capacity for its frozen food division. At that time, Thompson also announced the creation of a new division to service prep-schools and colleges in complete food operations. Sales of the company's line of oven ready frozen goods in 1957 had shown a 60 percent increase over 1956.

On the surface there was the appearance that Thompson might get into its own freezing and storage facilities. In mid-August financial publications carried the announcement that Thompson would acquire additional processing facilities for its Holloway House line of frozen food. However, a public refrigerated warehouse provided the facilities needed by Thompson for processing and storing. The space was leased on a long term contract from Lafayette Refrigerated Services, Inc., the new organization at Lafayette, Ind. operated by Continental Freezers of Illinois.

Refrigerated Warehousing Boosted By New York Agency

Port of New York Authority, an inter-state regulatory and promotional agency, in their August issue of VIA PORT OF NEW YORK, a monthly, featured refrigerated warehousing in that area. The article, entitled "Keeping Cool at the Port of New York", not only carried a fine reader article on how public cold storage serves New York citizenry, and indirectly the Nation, but also was very well illustrated with pictures of the establishments in the various boroughs and on the Jersey side of the Hudson.

Recommends Pier Leases

However, about the time the agency's magazine was published, the New York Times was reporting a proposal that eleven idle municipal docks on Staten Island be refrigerated. Staten Island Citizens Planning Committee had met that month in an effort to develop some business for these idle piers. Lewis H. Rabbage, Chief Engineer, Marine and Aviation Dept. New York City's responsible agency, suggested that tenants might be attracted to the docks if they converted them to refrigerated piers. He said the city had no refrigerated piers but that a need for them was developing. The Staten Island Chamber of Commerce was urged to promote business for the piers in much the same manner that the Port of New York Authority and Pouch Terminals attract tenants to their three piers which are fully tenanted.

Buffalo Firm Sold

Private warehouse became public space in the sale of Fairmont Foods Co. Cold Storage warehouse in Buffalo to a Cleveland company. Although Fairmont announced long range plans for expansion of its dairy products processing and manufacturing operations, it disposed of its 136,000 sq.ft. warehouse to National Terminals and Refrigerating Corp. a wholly owned subsidiary of National Terminals Corp. An eight story brick warehouse with basement, the building has both refrigerated and dry storage space. It was built in 1926. Sale terms were not announced.

Refrigerated Storage Capacity

Reporting at mid-year, USDA, showed that refrigerated warehouse capacity in the United States, as of October, 1957, is 900 million gross cu. ft. Nearly one-half of that space was sub-zero, the cooler and freezer capacity still holding the edge over low temperature storages. Gains were reported in all geographic areas, but Pacific states, South and Middle Atlantic and West South Central showed largest gains.

NARW "Cold Facts" summarized the USDA's space survey, reporting an increase of nine percent in public refrigerated warehouse space, to 545 million gross cu.ft. Private and semi-private construction was up 19 percent by comparison, although meat packing space was down nine percent. The NARW summary tabled government figures into three types of warehouses, public, private and meat packing, providing a more useful means of comparison.

Private Construction Continues Its Pace

Kraft Foods recently announced it would expand its cheese processing plant at Ulm, Minnesota. Bryant H. Prentice Jr., General Manager of Kraft's central division, Chicago, indicated the addition would house four bulk storage coolers, a finished goods cooler and additional dock space.

Moving toward October completion is a new $150,000 plant for Smith and Nelson, Inc. at Tonasket. The new warehouse will hold a bulk bin storage equivalent to 145,000 standard size apple boxes. The structure is 120x100-ft in cold storage area with a processing area of half the size adjacent to it. Tilt-up concrete construction ranging as high as 36 ft. is being used. Growers served by Smith and Nelson have new orchards coming into production which necessitated doubling the firm's space.

Fire Loses In West

Elsewhere in the West, wire services report that Terminal Ice and Cold Storage Co. Portland, Oregon, at mid-year was completely a new cold storage and quick freezing facility with costs in the neighborhood of a half million dollars. In the same city, a Northwestern Ice and Cold storage plant sustained an estimated $70,000 four alarm fire.

North of Portland, in Vancouver, Washington, a $150,000 fire destroyed a couple of commercial buildings occupied by the Washington Coop Farmers Association and Columbia Ice and Cold Storage Co.

Canadian Storages

Norfolk Fruit Growers Association, Simcoe, Ontario, received considerable publicity in the public and trade press last Spring in connection with its new controlled atmosphere storage for certain varieties of apples. The new building, in excess of 170,000 cu.ft., with a capacity of 54,000 one-and-one-eighth bushel boxes cost in excess of $220,000. It is divided into four storage rooms 18 ft. high, served by a 50-ton halocarbon system.

According to the Association, it is necessary to make an analysis of the storage atmosphere twice each day to determine how much oxygen or caustic is required to maintain the correct atmosphere. Fall 1957 apple crop was placed in the room in October and not opened until March. A total 60 thousand bushel was handled in the new facility. The plant's older facility is capable of handling 225 thousand bushels.

Artic Storage Co., a corporation headed by Ralph Hanford, Toronto, is constructing 4500 sq.ft. storage space at a cost in excess of $110,000. The warehouse is to be 18 ft. high and will employ a new type of wall insulation. All refrigeration equipment will be located in a basement machinery room. Hanford was formerly Vice President of a Canadian Grocers Chain with more than 300 outlets.

Activity Abroad

Zero Processing and Storage Co., Jamaica, just opened a frozen food processing and packaging plant at a cost in excess of $600,000. Including a cold storage plant, the freezer operation was financed partially by Jamaican Government funds and partially by the Barclays Overseas Development Corp.

In Brazil two refrigerated warehouses opened, both to be used principally for handling meat production. The warehouse in Brazil, said to have a capacity to package 150 tons of meat per day operates its own airplanes to bring pre-refrigerated carcasses from the growing ranges. The other warehouse is located in the State of Ceara.

Under construction in Ghana, Africa, is a new cold storage plant which will have an initial capacity of 1500 tons and space for expansion to 3000. It is being constructed by a Ghana government entity in cooperation with three Danish and one Norwegian firm. It will offer facilities for bulk storage of meat, fish and dairy products. Feature service offered by this facility is a fleet of refrigerated trucks to carry product between the countryside and warehouse, and from warehouse to ship piers.

Refrigerated fruit storage of 30,000 cu.ft. has just been completed for the Horticultural Coop. at Nairobi, East Africa. A new cold storage space has just been started in Mombasa for A. Baumann Co. Ltd.

Swedes In England

Building a depot in Britain is a Swedish deep freeze chain, Helsingborgs Fryshus. The plant is being built at Grimsby for distribution of deep frozen goods arriving at that port. In excess of one million cu.ft., the plant will also be able to accommodate butter, bacon and eggs. It is equipped with Swedish machinery throughout. Swedish quick frozen products sold in Britain last year ran in excess of four million dollars, and they expect sales to be much in excess of that figure this year.

At Southampton, the British Transport Commission has just completed a new cold store pier. MODERN REFRIGERATION in a two month series has completely described the International Cold Storage and Ice Co. Ltd. facilities (the title under which the organization operates). The building is 250x150x60 ft. high with two refrigerated floors. Provision was made for a 50 percent extension. The new building is replacement for an original built in 1902 and destroyed by enemy action in 1940.

Public Cold Storages Offer Sales–Service

▶▶▶AFFILIATED Cold Storage Companies, Inc., a cooperative sales service organization for public refrigerated warehouses, has now been in operation since June 1. Headquarters are at 105 West Madison St., Chicago 2. There is a branch office at 36 West 44th Street, New York 36. The company expects to open a West Coast office shortly. Walter Taylor, President, and Maury Janovitz, Manager, met early in September on the West Coast with more prospective members.

Present membership consists of the following companies: Central Cold Storage Co., Chicago; Cincinnati Terminal Warehouses, Inc., Cincinnati; The Sheriff Cold Storage Co., Cleveland; Alford Refrigerated Warehouses, Dallas; Central Service Co., Des Moines; Hartford Freezer Corp., East Hartford; Hudson Refrigerating Co., Jersey City; Midwest Cold Storage & Ice Corp., Kansas City; Tennessee Quick Freeze & Storage Corp., Memphis; Milwaukee Cold Storage Co., Milwaukee; Atlantic Refrigerating Co., Newark; North Pole, Inc., Pittsburgh; Gulf Florida Terminal Co., Inc., Tampa, and The Wichita Ice & Cold Storage Co., Wichita.

LOXYGEN

Liquid Oxygen (LOX) Popular For Process

Reprinted by permission, from
INDUSTRIAL BULLETIN
OF ARTHUR D. LITTLE, INC.

▶▶▶**SINCE WORLD WAR II,** oxygen has been sold increasingly as a liquid. Most commercial uses of oxygen call for a gas, but it takes a 5 1/2 pound container at a pressure of 2400 psi to ship one pound of compressed gas; by contrast, one pound of liquid oxygen (LOX) requires only a 3¼ pound container, although it must be insulated.

In its liquid state, oxygen is dangerous; not only is it so cold—it boils at minus 297°F. at atmospheric pressure—that it will freeze or "burn" living tissue, but it is highly explosive when contaminated or mixed with organic matter. The transportation of oxygen has thus become a complex maneuver, requiring special handling techniques.

Large purchasers of LOX generally have on hand supplier-furnished equipment for converting back to the gaseous state; if so, the oxygen is stored as liquid and converted to gas at time of use. When smaller companies receive the liquid, the delivery equipment includes a liquid-to gas converter and the oxygen is stored as a gas. Special pumps permit conversion of gas at desired pressure.

Liquid Oxygen in model missile tank. Here the automatic LOX level control system is being tested over an extended time period. The entire system has, therefore, been cooled down and the LOX is stable, i.e., boil-off is at a minimum and there is no visible vaporization.

Most liquid oxygen is transported by trailer trucks, generally having 3000 to 4000 gal capacity; for particularly long hauls, railroad cars with similar tank design are used. LOX shipping tanks are vented to the atmosphere to allow free evaporation without pressure build-up.

Steels Are Big Among New Users

Most important uses of liquid oxygen are in steel production, in making various chemicals, and in the fuel systems of missiles and certain aircraft. In 1956 total consumption in the United States was approximately 8400 tons per day; one estimate predicts that by 1966 total annual consumption will have increased threefold. Almost all oxygen produced is recovered from air by liquefaction; there are several processes, but all are designed to lower the temperature of air until the various gases condense, when they are separated by fractional distillation. (Air is a mixture of gases and each has a different boiling point.)

In the chemical industry, oxygen is needed in certain processes for the manufacture of ammonia, acetylene, ethylene oxide and oxidation chemicals. Use of oxygen permits chemical reactions to be carried out faster at higher reaction temperatures and results in fewer impure by-products. LOX consumption by the chemical industry alone is expected to double by 1966.

An even greater increase in demand will probably occur in steel production, where oxygen has several uses; total consumption by the steel industry now averages 200 cubic feet of oxygen for every ton of steel produced, compared with only 30 cubic feet in 1930. Up to now, "scarfing"—the removal of scale and imperfections from steel billets before rolling, for cutting and in preparing scrap iron.

A more recent development, which is expected to gain wide acceptance, is use of the so-called oxygen converter to purify molten iron. The method is similar to the Bessemer process, which consists essentially of blowing air under pressure through molten pig iron until the impurities (mainly silicon, manganese, and carbon) are oxidized. But the oxygen converter performs much more efficiently and permits more kinds of steel to be produced. Less well accepted is the use of oxygen in open-hearth and blast furnaces to enrich the air stream and thereby gain increased output at lower unit cost.

Essential To Missiles

Over a year ago the Office of Defense Mobilization announced an increase of 480 tons per day in its high-purity oxygen goal. The Air Force requires a large quantity of oxygen for use in high altitude breathing equipment, but ODM's primary interest is in using LOX with a liquid hydrocarbon such as kerosene to propel missiles. Since a missile's flight will take it to outer space where there is no oxygen supply from the air, liquid oxygen is burned with the fuel to get thrust. Characteristic of pre-launching photographs taken at Cape Canaveral is the white stream rising from the rocket caused by moisture in the air condensing and being frozen by the very cold LOX.

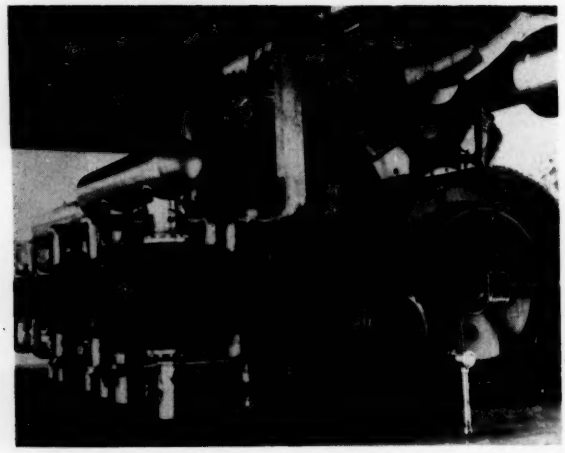
Linde Company Providing Oxygen For Steel Making

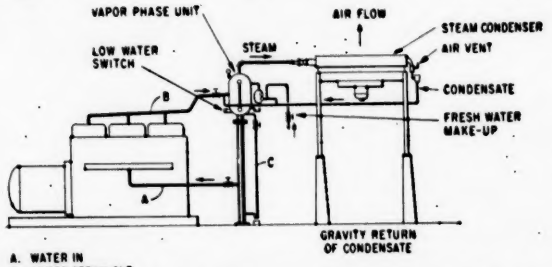
▶▶▶GARY WORKS of the U. S. Steel Co. receives its oxygen requirements from a new plant constructed there by the Linde Co., a division of Union Carbide Corp. The plant was placed in operation in August 1958.

One year ago a new oxygen producing plant was placed on stream at U. S. Steel Corp.'s Duquesne, Pa. works. The Gary installation was scheduled at that time as well as one at Chicago. Built by Linde Co., the Duquesne plant produces more than 500 tons of oxygen per day.

Just announced, the Linde Co. will build a 300 ton per day plant for producing oxygen and nitrogen at Pittsburgh, California. Production is scheduled for June 1959. The release stated that the oxygen-nitrogen plant is to meet the needs of the West Coast missile industries. The first section of the plant is slated for a capacity of 115 million cu. ft. /mo.

Ebullient Cooling For Engines





—Sketch courtesy of Engineering Controls, Inc.

Above, a typical hook up for an ebullient cooling system.

Left, typical of the stationary engine in which ebullient cooling finds use, is this refinery unit used in ammonia synthesis process.—*Photo Courtesy of Dow Chemical Co.*

▶▶▶ WINTER around the corner has prompted erstwhile anti-freeze salesmen to start pushing their automotive line. Concurrently, their counterparts in the power field have literally broken out samples of the merchandise for their internal combustion engine customers. However, the engineer is not usually so happy over the prospect of a freeze-up which the lower temperatures may bring.

Compound to be introduced and featured at the 23rd National Exposition of Power and Mechanical Engineering, NYC, Dec. 1-5, 1958, have cousins which are now more suitable for ebullient* cooling in fuel gas engines and pump cooling systems such as pictured in Fig. 1. Development of the first product specifically designed for use in ebullient cooling —cooling by means of a boiling heat-transfer medium—is being credited to The Dow Chemical Co.

Ebullient cooling, though it has been used for more than 50 years and though it has distinct advantages over conventional cooling methods, has had limited acceptance due to cold weather problems in temperate climates. Water is generally used as a coolant and must have a freeze-point depressant when temperatures drop to freezing or below.

Attempts to use a standard anti-freeze such as ethylene glycol have not been generally successful, since this material will not azeotrope (form a constant boiling mixture) with water. Though water in the engine itself may be protected, vapors produced by the boiling mixture contain only water which can freeze in the condensate return line.

*Bubbling or boiling coolants.

Uniform Ebullients Extend Engine Life

Advantages of ebullient cooling are uniform engine temperature, faster warm-up, automatic circulation and temperature control of the coolant, elimination of the water pump, reduction of corrosion, increased lubricant life and the possibility of using cheaper, sulfur-bearing fuels.

In an ebullient cooling system, circulation does not start until the coolant reaches the boiling point. Vapors rise through the system and are collected and sent to a condenser which condenses and returns them to the system (see Fig. 2). In most cases the conversion of conventionally cooled engines to ebullient cooling is possible. Ordinarily no pump is needed, since circulation is by natural convection.

Whereas in conventional cooling there may be a temperature rise of around 40 F. in the coolant as it travels through the cooling system, ebullient cooling allows a temperature rise of only 2-3 F. throughout the system. This prevents uneven expansion of cylinder walls which can cause increased oil consumption, metal stresses, friction and engine wear.

Coolant temperature remains the same at all engine loads in ebullient cooling, since the coolant circulation rate is automatically regulated by the engine heat generated.

Of many materials tested by Dow for this use, Dowtherm 209 was found to be the best for use in ebullient cooling. It gives freeze protection both in the engine and in the condensate return line. It is recommended for use in a 53 per cent (by weight) solution in water. This mixture gives freeze protection down to minus 45 F.

Power Show Features

▶▶▶ NEW TECHNIQUES in heat control will be featured among advanced designs at the 23rd National Exposition of Power and Mechanical Engineering in the New York Coliseum, December 1 to 5. Applications of the so-called thermal liquids which, unlike steam, are capable of absorbing heat without developing heavy pressures at high temperatures.

Ebullients and Eutectics

"Pressureless" systems, employing special chemical liquids—and in one instance even eutectic salts—are used in temperature ranges from minus 100° to plus 1000° F. for both heating and cooling applications. As a matter of course, the use of high temperature non-vaporizing media entails specially engineered heat-exchange equipment in which heat transfer rates are controlled throughout.

Power Continuity

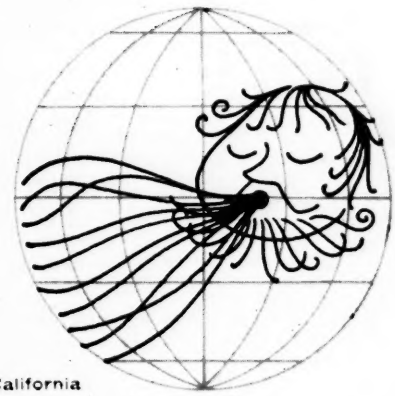
Uninterrupted power supply is of increasing importance as humanity becomes more highly dependent on electricity. In public auditoriums and in such other uses as institutions it is often required by law, while many industrial operations would be heavily damaged were not emergency current available in the event of power line failure. Several exhibits will offer solutions for this problem. Standby power is also featured on the NAPRE annual program at Miami, Nov. 11-13.

Instrumentation

Instrumentation for the power plant continues to provide more precise information, more readably presented and with man failure improvements.

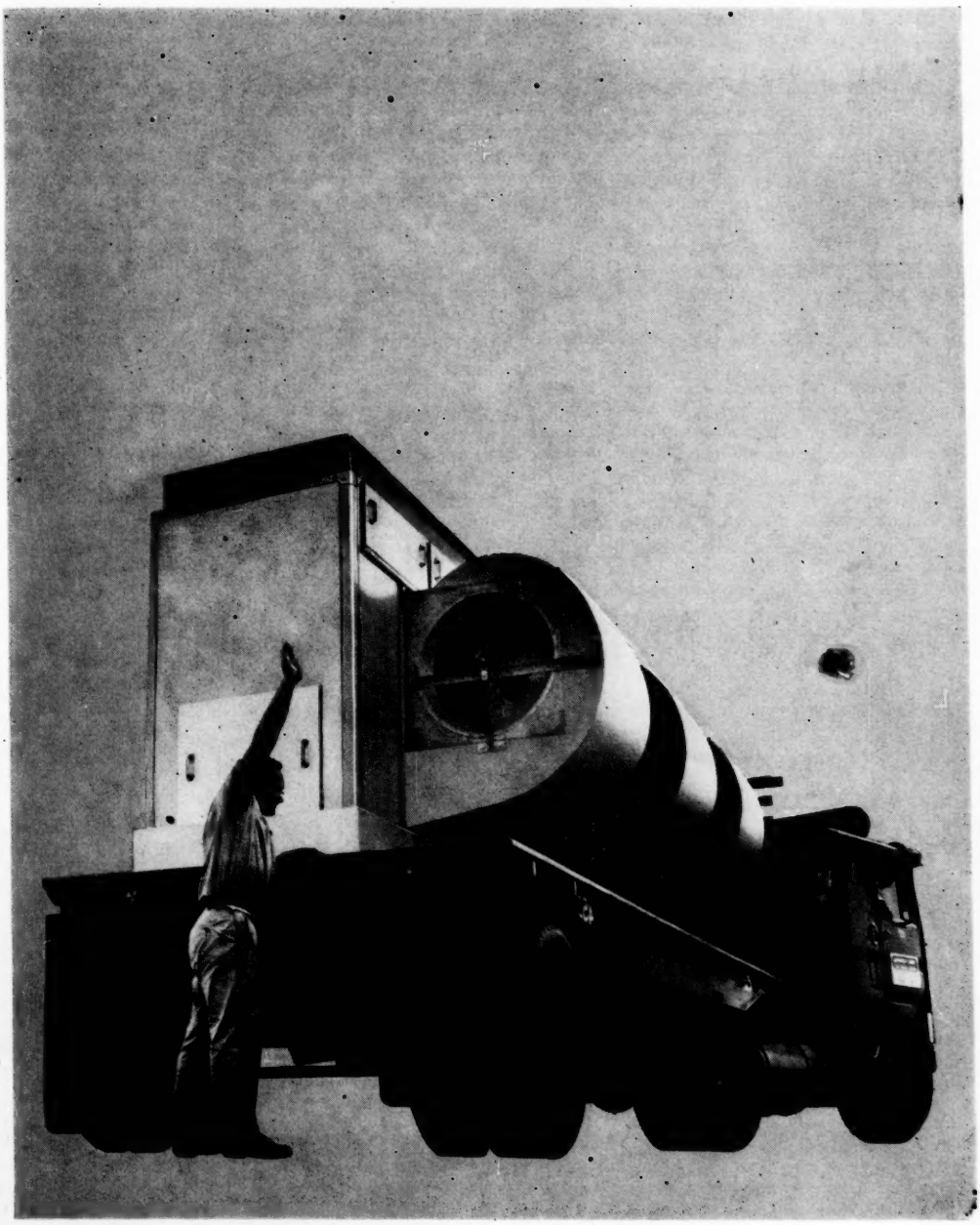
Engineering the temperature...

with a ONE PIECE, 233 TON Evaporative Condenser. Factory assembled and shipped as a unit, the compact DF-41A is only 93" high, 96" wide and 247" long.



RECOLD **CORPORATION**
7250 East Slauson Avenue, Los Angeles 22, California

RECOLD



NAPRE QUESTION BOX

HAVE A QUESTION? Address it to Prof. Harold P. Hayes, Dean of Engineering, State Polytechnic College, San Luis Obispo, Calif. Answers appear monthly in this department on problems forwarded by NAPRE members. Comments from all readers welcomed.

H. P. Hayes

Oil Removal With Safety

QUESTION: More than a month ago our Chapter instructor and a couple more experienced engineers advised that I should discontinue using my refrigerant pump-down compressor as an air compressor. When I wanted to blow oil out of my coils, because of the convenient piping arrangement, I have used the pump-down compressor to produce 100 to 125 lbs. air pressure for blowing air out of the coils. The instructor and these other engineers went to great pains to point out the hazards, for which I am thankful but still a little skeptical.

In another publication the other day, I read the following: "The coils were pumped out, disconnected and blown with compressed air at 125 pounds pressure to insure the complete removal of oil accumulations. Oil drains were installed and the drain pipe extended to the outside of the building."

The consulting engineer who wrote that not only enjoys a reputation of being an outstanding consultant but he is a member of the NAPRE National Educational Committee. I fail to see the difference between the practice I use and the practice he described. He apparently was getting air from another source, whereas I used my available pump-down compressor to obtain the necessary air pressure for oil removal. Can someone re-define the hazard in my operation? I seem to be missing the point.—C.P., Chicago.

ANSWER: Not many plants have air compressors available for supplying air at pressures required for testing and for blowing oil from the system. For many years I have used ammonia compressors as air compressors for pumping up air test pressures, both for checking new pipe work for leaks and for blowing oil accumulations from ammonia evaporators.

For testing new work, the test pressure for the high side of the system usually was 250 pounds and for the low side, 150 pounds, gauge. For blowing oil from ammonia evaporators, I have found that pressures of 100 to 125 pounds effective. When testing shell and tube brine coolers, whether testing for possible leaks or for removing oil accumulations, do not subject such vessels to air pressures in excess of 50 pounds.

When pumping an air pressure on ammonia piping systems, the following rules should be followed:

Application Procedure

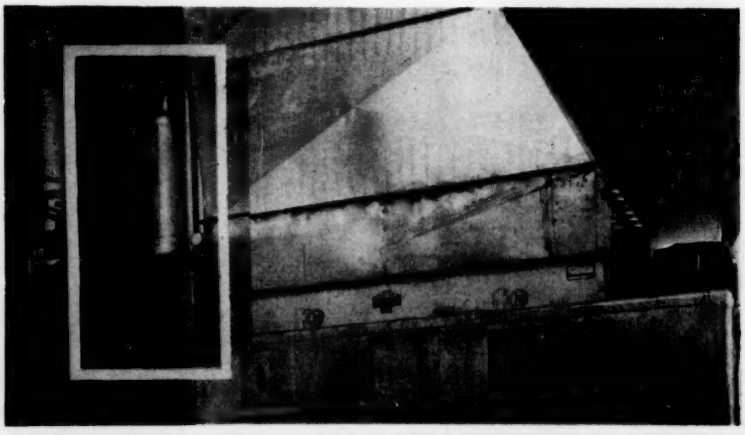
1) Pump out the NH_3 thoroughly before pumping up an air pressure on any part of the system from which oil is to be removed by air pressure.
2) Turn water on the condensers so as to cool the compressed air by removing some of the superheat.
3) Raise the pressure in increments of 50 pounds, allowing the system to stand 30 minutes between pumpings.
4) Never leave the compressor unattended while it is in operation.

If the above recommendations are followed, there is no danger of explosions resulting from mixtures of air, ammonia and oil.

It is not the source of the air pressure (whether a pump-out ammonia compressor or a small circulating air compressor) that effects the accident hazard. It is the way the operation is handled that is important. Air under pressure behaves in the same manner regardless of the type of compressor used. However, a pump-out ammonia compressor with the usual cylinder water jacket would appear to have an advantage since the water removes some of the heat of compression delivering much cooler air to the piping system under test, than will a high speed air compressor with it's cylinders cooled only through heat dissapating fins.

—C.T.Baker, Atlanta.

(Editorial Note: At press time an announcement was received introducing an oil removal device which could conceivably eliminate this small intermembership controversy at Chicago, NAPRE. Hy Jarvis says that Recold engineers have solved the problem of oil getting into ammonia evaporators and refrigeration systems with a new oil trap on which a patent is pending. It is used in conjunction with desuperheat coils of Dri-Fan condensers.



Typical oil trap as mentioned in the editorial note appears to the left of the desuperheat coil on this evaporative condenser. Manufacturers state that such an oil trap must be used in conjunction with evaporative condensers equipped with desuperheat sections.

Condensing Pressures Prompt Two Queries

QUESTION: What are the effects of high condensing pressures on a refrigeration system?

What are the causes of high condensing pressures?—Q.M., NYC.

ANSWER: Generally, most authors, speakers or instructors will place cause ahead of effect. Leave it to a practical engineer to be really practical, as QM is here. He can see the effects in his plant, wants this column to verify his observations and then give the readers why. Credit for these answers to ME/L, NYC.

Some of the harmful effects on the system are:

1. Overloads the compressor motor.
2. Reduces refrigerating effect.
3. Possibility of raising the relief valves, blowing the gaskets, or perhaps reaching explosive pressures and dangerous temperatures.
4. Overheats compressor valves, pistons, and cylinders causing their untimely failure.
5. Causes excessive use of cooling water if a water-regulating valve is installed in the system.
6. Puts excessive load on V-belts.
7. If the system is an automatic one this will cause short-cycling on the high-pressure cut-out switch.
8. System might shut down due to opening of overload relays.
9. Refrigeration system may not be able to carry the load.
10. This can cause lubricating oil to break down in both compressor and motor leading to untimely bearing failure, valve stickage, etc.

Following are some reasons for high condensing pressure:

1. High cooling water temperature.
2. Dirty condenser tubes.
3. Low cooling-water pressure.
4. Springs set too high or water-regulating valve stuck closed.
5. Overcharge of refrigerant.
6. Refrigeration load too high.
7. Capacity of the condenser too low.
8. Faulty discharge pressure gage.
9. Compressor discharge valve restricted or closed.
10. Non-condensible gas in the system.

BASIC REFRIGERATION, the official NAPRE text covers this topic in Chapter 14 and partially in Chapter 21. The subject will receive considerable attention at the annual meeting of NAPRE at Miami on November 11-13. However, the repetition of the question from a number of Chapters, NAPRE, indicates it might be an excellent review topic for a Fall or Winter Chapter meeting.—**H.P.Hayes.**

Adding Alcohol To A System

QUESTION: Recently a speaker before an engineers group stated that a lubrication manufacturer recommended addition of a small amount of alcohol in an ammonia refrigeration system. Intent was to prevent formation of detrimental deposits and to keep compressor rings free. What about this practice? Can any serious consequences result chemically or physically?—R. H. Chicago.

ANSWER: Frankly, this is the first occasion that I have had to consider the addition of an anti-freeze of the methyl alcohol type to an ammonia system. I do not see what purpose the addition of alcohol would serve, other than possibly to be used as a solvent for materials which might be produced in the system as a result of oil deterioration. If this is the intent, I question whether a poorer solvent other than water could have been selected.

$NH_3 : H_2O/500 : 1$

As you know ammonia will dissolve approximately 500 times its own volume of water and the freeze-up problem virtually does not exist in an ammonia system. Most ammonia systems are quite wet but due to the alkalinity of the system no appreciable corrosion problems seem to result.

Doubtful Advantages

We would not expect any outstanding or detrimental chemical reaction from the addition of an anti-freeze such as methyl alcohol nor would we expect any outstanding improvement from its addition. As far as we are concerned water is a contaminant in any system and we see very little advantage to be gained by the addition of another contaminant whose benefit is very doubtful both from a solvent standpoint and from an anti-freeze standpoint. Without doubt the ammonia itself is probably as good or better an anti-freeze in this particular case than the methyl alcohol.

In Halocarbon Systems?

Methyl alcohol is sometimes added to halo-carbon refrigerant systems in order to lower the freezing point of the water-refrigerant mixture to reduce the freeze-up problem at the flow control. It is generally considered detrimental under those conditions if the amount of alcohol exceeds one percent based on the weight of the refrigerant.

Our viewpoint on the addition of methyl alcohol to halo-carbon refrigerant systems is purely and simply one of being unable to see why anyone wants to treat the symptoms rather than removing the cause, which is the water itself. Water is very easily removed and it makes much more sense to remove the water and stop the other chemical side reactions which result in corrosion, plugging and oil deterioration.

J. D. B., Ansul Chemical Co.

Eutectic Tables Sought

QUESTION: Where can we locate a table that will show various eutectic compositions, or a list of salt solutions for use in eutectic plates which would be used for refrigeration effect at minus 10 to minus 20 F? Where can literature be obtained which would include corrosion prevention treatment for such solutions?
—B.B.C., Maracaibo, Venezuela.

ANSWER: Eutectic concentration and temperature of various aqueous solutions can be determined from the extensive data given under the heading "Freezing-point Lowering of Aqueous Solutions" on pages 254-263 of the INTERNATIONAL CRITICAL TABLES, Volume 4, McGraw-Hill Book Company, 1928.

This source lists several solutions which have eutectic points in the minus 10° F to minus 20° F range. However, the suitability of any of these solutions for a eutectic plate application will depend upon many factors, such as effective latent heat, sharpness of eutectic point, stability of solution, cost of solute, corrosive tendency, toxicity, necessity for additives to improve performance, etc.

The particular eutectic solution employed will determine the corrosion prevention treatment required. The following books should be of some help in this regard:

Evans, U. R., METALLIC CORROSION PASSIVITY AND PROTECTION
Longmans, Green & Co., New York 1946.

Evans, H. R., AN INTRODUCTION TO METALLIC CORROSION
Edward Arnold Co., London, 1948.

Uhlig, Herbert H., THE CORROSION HANDBOOK
John Wiley & Sons, New York 1948.

Speller, Frank N., CORROSION—CAUSES AND PREVENTION
McGraw-Hill Book Co., New York, 1951.

—W. E. Lauterbach, Chief Eng.
Dole Refrigerating Co., Chicago.

(Continued on Page 24)

NOW important savings for cold storage

New J-Foam

J-Foam is

Remarkably Lightweight!

A cubic foot of J-Foam weighs only one pound; a single workman can easily carry a dozen sheets at a time.

Large sheets are easily,

Quickly Installed...

operators with—

Insulation by Johns-Manville

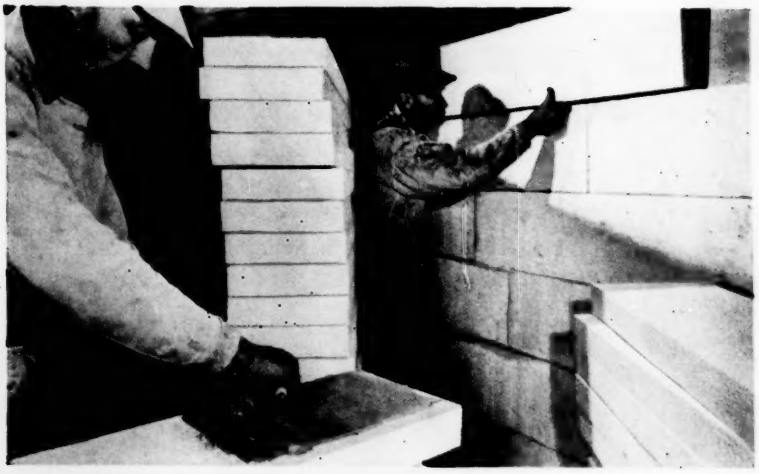
An improved, expanded polystyrene insulation . . . J-Foam reduces installed costs, assures long-term operating economy

COMPARE J-FOAM with other coldroom insulations and see the difference it makes in installation cost alone. See how easily it handles . . . how quickly it is installed . . . how well it can be applied to either wood or concrete construction.

After installation—savings go on year after year. For J-Foam's conductivity (Btu-in./hr/sq ft/F) is *extra low*, only .23 at 19F—.25 at 40F—.27 at 70F. And keeping conductivity always low is J-Foam's moisture-resistance; its water vapor permeability, for example, averages only 1.5 perm inches.

Let us send you the new J-Foam brochure, IN-209A. Write for it today. Address Johns-Manville, Box 14, New York 16, N. Y.

One man can easily place a sheet of J-Foam in position and hold it momentarily while adhesive grips. Lightweight . . . larger sheet sizes . . . ease of securing—all work to speed installation.



J-Foam Is Strong...

ideal for self-supporting partitions.

J-Foam's high strength and resilience solve many installation problems. It is ideal for self-supporting partitions . . . for walls, floors and ceilings of wood or concrete construction. J-Foam is also easy to cut; provides excellent surface for adhesive fastening.

See the informative new color motion picture —"Heat . . . the science and economics of its control." Ask your J-M representative.

JOHNS-MANVILLE

100 YEARS OF QUALITY PRODUCTS . . . 1858—1958

JOHNS-MANVILLE JM PRODUCTS

(Continued From Page 21)

Pakistan Inquiry On Eutectic Plates

QUESTION: Here in West Pakistan our method for ice cream sales is to send out hand carts. Carts have containers arranged all around and ice filled with sodium chloride added. Ice cream packets are placed between the containers. It is desired to replace this system which is quite troublesome. However, motive power for the carts is out of the question.

It may be mentioned here that another factory places metallic boxes 18 x 24 x 2 in. in their hand carts. These boxes are totally enclosed and are placed in the carts without ice. They maintain the required temperature for 24 hours and of course the ice cream doesn't melt. What do these metal containers hold? How long do they have to be placed in the main plant and at what temperature, in order to serve adequately in the hand carts when they are returned to them?
—M.A.Q., West Pakistan.

ANSWER at right by —
—W. E. Lauterbach, Chief Eng. Dole Refrigerating Co., Chicago.

ANSWER: The metal containers mentioned in your question probably contain a eutectic solution which will melt at a given constant temperature, absorbing a given total amount of heat at a rate depending on container surface area and on temperature difference between container and ambient air.

For example, sodium chloride eutectic solution, commonly used in your type application, in an 18 x 24 x 2 in. cartridge will melt at minus 6° F, have a holdover capacity of 2700 Btu and will absorb heat at an hourly rate of 210 Btu for a 15° F temperature differential. It would require approximately seven hours to freeze the eutectic solution in this cartridge if one side is in direct contact with a minus 20° F plate type evaporator.

The size, type and number of cartridges required to maintain proper ice cream temperatures in your hand carts would depend upon the size of ice cream compartment, type and thickness of insulation, temperature of ice cream at loading, outside ambient temperature, number of door openings, number of hours on the street, etc. Eutectic cartridges for this application are commercially available.

Controlling Heat Gains with Air Curtain

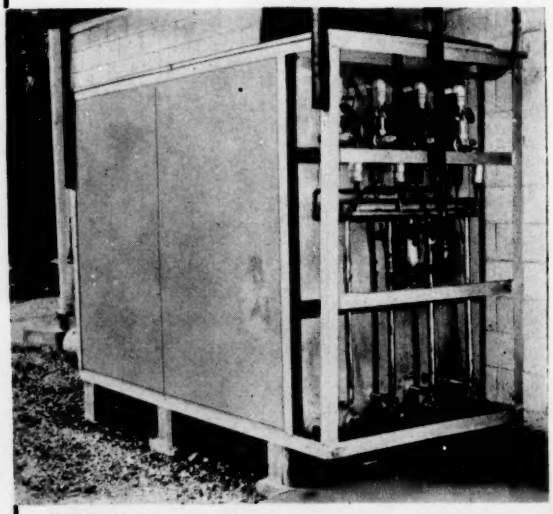
QUESTION: This may be a question for the Reader Service Department rather than the Question Box, but here goes: Where can we get information on a recent development which is in the nature of a doorless door? This is an air screen across an open door which allows people to leave or enter at will, but prevents a loss of refrigeration through the access—R.S.W., Florida.

ANSWER: American Air Curtain Corp. introduced the controlled circulation of air over an access area for the purpose of preventing heat infiltration or loss of cooler air currents into an air conditioned or refrigerated area. The firm is located in St. Louis, Missouri, and, as you mention in the question, the Reader Service Department will be glad to furnish address.

In effect the system consists of equipment and devices for directing air flow over an open access area, controlling the temperature of the air by means of refrigeration. The air is introduced at the top of the opening and recovered through grids or grilles at the base of the access.
—J.R.K.

Ice Water Galore with the "King Zeero" System

Quick, Automatic Product Cooling - 32°-34° Recirculated Ice Water - Guaranteed, for your peak cooling loads



Ehrlers Dairy, Louisville, Ky., installed this "King Zeero" unit in 1948. To meet expanding business, they recently purchased 2 additional 13,000 lb. "King Zeero" Ice Builders.

1 NO Moving Parts
2 NO Extra Power
3 NO Mechanical Agitation

Greater Ice Capacity • Lower Cooling Costs

• Ice is built up on the coil plates during the off-load period, using your own compressor. This assures an ample supply of refrigerated water for your peak cooling load at the time and place you need it.

• The ice water is pumped to your product cooler and returned for recooling. The water passes over all of the ice surface on its way through the "King Zeero" Ice Builder. Only in the "King Zeero" does this occur.

• Saves power through smaller compressor requirement. Simple construction. Dependable in performance. Low operating and costs.

THE KING ZEERO COMPANY
4300-14 W. MONTROSE AVE., CHICAGO 41, ILL.
Manufacturers of Ice Builders - Ice Builder Cabinets - Ice Banks

NEW QUESTIONS:

Refrigerating With Agricultural NH_3

QUESTION: There are, we believe two grades of ammonia being manufactured, one is commercial and the other refrigeration grade. We would like to be assured that we are supplied anhydrous ammonia of the refrigeration grade. What is the composition and physical property of this commodity and how can it be tested to assure us that it is refrigeration grade? What are the disadvantages of commercial grade anhydrous ammonia for use in refrigerating plants?
—K.R.B., Karachi.

Agricultural grade ammonia (so-called) is being made available in many areas where refrigerating plants are located. We have been told there is no difference between this ammonia and the kind purchased from refrigeration supply companies. The Question Box can render a service if it would publish unbiased and authentic information on both kinds of ammonia.
—NAII.

Vinegar Counteracts NH_3

QUESTION: Our chapter president tells us that a sponge saturated in vinegar will act as a temporary gas mask. Paul B. Christensen, NARW, quotes a warehouseman as writing "vinegar sprayed in an ammonia contaminated room reduced the odor to zero". Why? What is it in vinegar that neutralizes the toxicity of ammonia?—D.D., FB Chapter.

Refrigeration Nomenclature

QUESTION: Wolfberg's articles in the November and December '57 issues of IR, like those of another year or so ago, are very good with respect to helping a practical engineer understand what the professional engineer intended. However, there is one thing he overlooked. How many operators without pneumatic control experience really know what he meant by an E.P. valve?—B.C.M., Dayton.

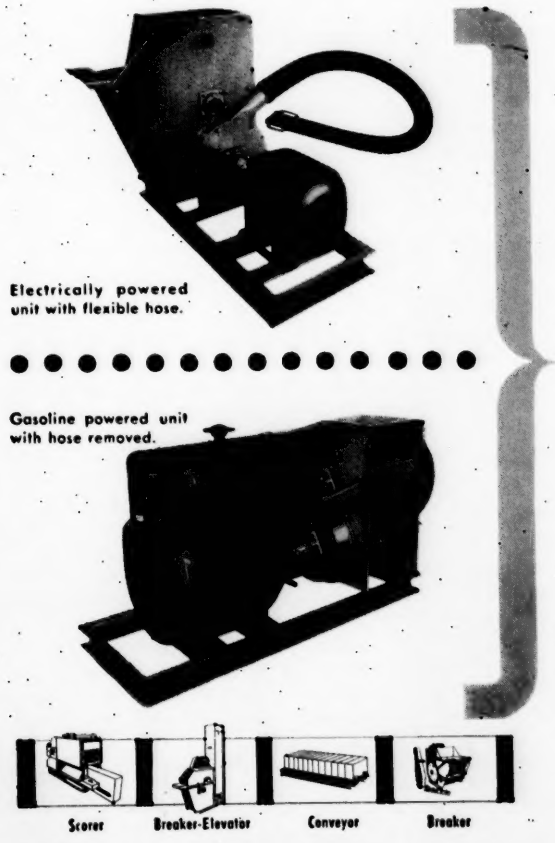
Insulation K Factor

QUESTION: What is the K factor of semi-rigid pre-formed one-inch thick fibrous glass insulation encased in a polyester film?—S.R., Minn.

Removing Oil From Aero-Sols

QUESTION: Aero-sol propellants received via rail car at our plant are discharged to storage by pressurizing the tank car (tankers have outlets similar to refrigerant receivers). We employ a Brunner compressor, 4-cyl. Model NR-10 (V type, 3-5/8 x 2-1/2-in) W56-1 operating at approximately 420 rpm. This unit taking suction from our storage tank, discharges through an oil separator and into the tank car at 70 psig.

Our problem is this: The supplier contends that we are contaminating the tank car with refrigerant oil and he is back-charging us for cleaning. Our oil separator has no name plate data on it so we do not know the particulars other than it has a 1-5/8 in. OD inlet and outlet, etc. However, we believe that the separator is probably too small or its structure is ineffective. Where can we find literature that would describe the most effective way of removing oil from the compressed aero-sols? They are mostly Refrigerant-12, and combinations of halocarbon gases.
—C.W., Chicago, Ill.



all new

G-W ICE CRUSHER-BLOWER

Snowballs Icing Profits

Here it is—the new Gifford-Wood Ice Crusher-Blower that can boost your icing service sales—*fast!* Now you can give better service—the kind of top-ice service that means repeat business. Shipments of perishables are pampered all the way to their destination with an even, protective cover of G-W crushed ice that penetrates to the farthest corners of trucks and railroad cars.

Choice of electric or gasoline powered motors with both portable or stationary models means you can build ice profits anywhere! What's more—this new G-W Crusher is surprisingly inexpensive...pays for itself in no time. Write G-W today for *all* the facts.

GIFFORD-WOOD CO.

Since 1814
Hudson, N. Y.

420 Lexington Ave., New York 17 • Railway Exchange Bldg., St. Louis 1
3537 Lee Road, Cleveland 20 • 565 W. Washington St., Chicago 6

Pacific Coast Representative
Western Ice Equipment Company, 420 Market St., San Francisco

Practical Refrigeration Engineer

EXECUTIVE OFFICE

National Association Practical Refrigerating Engineers
433 N. Waller Ave., Chicago 44, Ill.

Officers

Frank L. Chase, President
New Orleans, La.

Roy T. Burns, Vice-President
Detroit, Michigan

John N. Mariakis, Vice-President
Dallas, Texas

J. Richard Kelahan, Secretary
Chicago, Ill.

Leland M. Kenagy, Treasurer,
Kansas City, Kans.

George N. Paulick, Sergeant-at-Arms
Los Angeles, Calif.

Board of Directors

M. E. Bell, Board Chairman
La Puente, Calif.

John G. Muller, Kansas City, Kans.

Eugene Rytlewski, Chicago, Ill.

Cecil W. Sullivan, Memphis, Tenn.

Tom Weatherford, Dallas, Texas

S. Milton Rambo, Lancaster, Pa.

Bert G. McKenna, Chicago, Ill.

All refrigerating engineers are invited to affiliate with the National Association of Practical Refrigerating Engineers, Inc., an educational association, "not-for-profit".

From the President's Desk

Chase Vacations, Burns Steps In Sets Annual Meeting Theme

▶▶▶EACH YEAR, vacation time brings an opportunity for the first Vice President to get in some hitting practice. President Chase took his well earned vacation from the supervision of office building services and engineering, to personally supervise the formation of still another NAPRE chapter in Louisiana. However, the flu overtook him and he not only forfeited his column to a "veep", but his vacation and NAPRE plans as well. Full recovery is his present aim, although he has returned to work.

Refers To Message Emphasizing Slogan

Did YOU *study* President Chase's message in the August INDUSTRIAL REFRIGERATION? Your first vice president sure did a lot of thinking after reading that memo. Chase must have been in a most serious and reflective mood when he came up with those remarks for which our organization stands. If we as members would put on our thinking caps as he did, then follow his suggestions individually and in chapter operations, NAPRE would have a much larger membership list than at present. His Editorial brought home what NAPRE has meant to me. Read it again, think what it can mean to you.

Recommended Chapter Topic

Apply our slogan and its objective in chapter meetings. By combining educational objectives with character building, stature of NAPRE members will build all the reputation the Association seeks. Every practical man identified with the industrial refrigerating field will want to be a member.

Supervision, Training The Chief's Job

Abbreviated as it may be, the sub-head above expresses the additional duties expected of the chief engineer by his management. Responsibility for the operating machinery is of course the chief engineer's first duty, but that is not the total work expected of him. Personnel in his charge are to be guided, trained and handled with at least equal consideration as the equipment.

Roy T. Burns

The end objective is to train successors. This year the annual meeting of NAPRE has chosen this thought or idea as the theme of the educational sessions. With the encouragement from various industrial fields, NAPRE's Educational Committee will attempt a program along these lines.

Management-Engineers Luncheon Session Subject

Of eleven papers to be presented, three could be considered as contributing backbone to the chief's job. All three will be presented on Wednesday, Nov. 12. Leading off will be Dean W. R. Woolrich of the University of Texas. His topic concerns what management expects of the practical engineer in this modern refrigerating age.

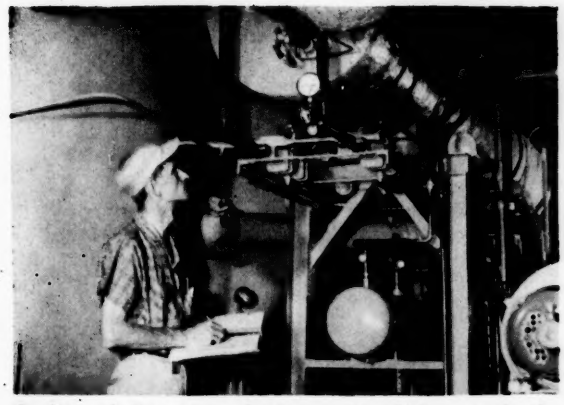
Woolrich will be followed by Dan Roop, Administrative Engineer for the Baptist Hospital, Memphis who will describe the training program used in his institution. Particular emphasis will be placed on the maintenance program. A national safety figure will follow Roop, discussing proposed codes, classifications in the industry and recent explosions.

Reasonable Investment

As a former chief engineer, as a former city inspector, and as an officer of NAPRE, it is a pleasure to put a "do recommend" stamp on this program. Ignoring the eight other papers for the moment, these three should warrant an investment by enterprising managements of nearly 200 dollars to send their chief engineer *across country* for such a training program.

R. T. BURNS
First Vice Pres., NAPRE

Cosmotron Cooling System At Brookhaven Laboratory



Cooling of the giant electromagnet which controls the protons accelerator at the Brookhaven Laboratory, is accomplished by a 100 TR system, a portion of which is shown here. H. E. Vanderoef, R&AC leadman reads the indicating instruments on the Patterson-Kelley water chiller.

▶▶▶ COOLING of the magnetic holding force for a three billion electron volt cosmotron requires sure and effective refrigeration. Demineralized water at 53 F and 500 gpm is required to cool copper windings. Refrigeration of the water is accomplished in the Patterson-Kelley water chiller with halocarbon refrigerant in the primary system. The refrigerant system employs two 50-hp compressors.

For research and test purposes Brookhaven National Laboratory has energy demands of up to 3 billion electron volts. This force produced by the 2,000-ton electromagnet literally spins protons around the 75-ft circular path at speeds in excess of three million revolutions per second. The giant particle accelerator holds protons on a steady course while a radio frequency amplifier boosts an additional thousand volts to the protons' energy each time they circle.

Chilled Water System

Cooling of the water in the P-K halocarbon refrigerant chiller is at the rate of 300 gpm. From the chiller the water goes to two 1,000 gallon storage tanks at 45 F. After flowing from storage to the recirculating 53 F system of the Cosmotron it returns to the chiller at appoximately 60 F.

Cooling water flows through coil windings of the magnets. The 48-turn windings are fabricated from 50-ft lengths of 3/4 to 1-7/8-in. copper bars, with each turn having a 3/8-in. internal cooling hole along its axis. The turns, electrically in series, are water cooled in parallel.

Four Part System

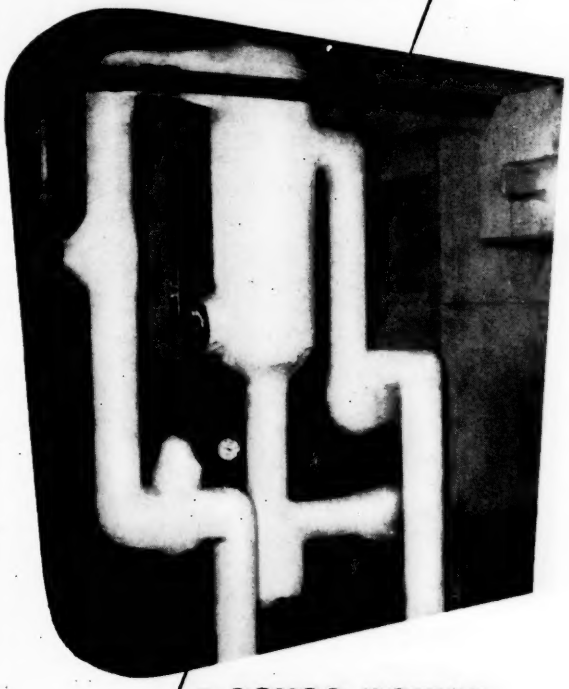
The Cosmotron is divided into quadrants, with each section containing 72 steel magnets. At the end of each quadrant, a copper manifold with 96 outlets connects the water system to the coil end of the conductors to form a separate cooling system for each four sections.

Flow meters in the waterline for each conductor are arranged to give warning signals for any flow failure, and inlet-outlet temperatures of each quadrant are measured and metered. The two-circuit chiller further safeguards the cooling system. If one circuit becomes plugged, the other circuit remains in operation to supply cooling.

GENUINE

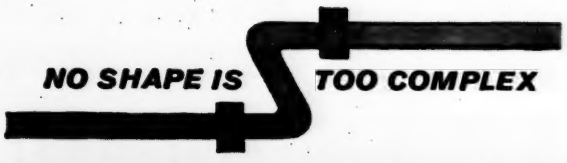
OZITE® *

STANDARD *All-Hair*
PIPE COVERING
INSULATION



• *saves power*
• *lasts a lifetime*
• *fits any form*

Leading refrigeration engineers find that wasteful heat flow is stopped quickly and easily by covering pipes and ducts with Ozite all-hair insulating felt. They find that easily-installed Ozite steps up refrigerating capacity of their equipment and reduces power consumption.

NO SHAPE IS  *TOO COMPLEX*

A PRODUCT OF
AMERICAN HAIR & FELT COMPANY

MERCHANDISE MART • CHICAGO 54, ILLINOIS

USDA Publishes Test Results On Eleven Car Trans-US Lettuce Lift

▶▶▶ CONTENTIONS have been raised between proponents of mechanical car and railroad reefers using conventional ice methods, as to which are better for certain produce. Differences of opinion are even widely varied between operators and users of salt ice cars as to salting practices, size and load patterns, types of containers, circulation, etc.

To be published in the October issue of Agricultural Marketing is a report on Railway Transportation Tests With California Lettuce. This report is based on a simultaneous shipment of lettuce in eleven test cars from Salinas, Calif. to New York City early in August 1957.

Nine ice bunker cars and two mechanically refrigerated cars were in the freight train which originated in Salinas, Calif. The 3,000 mile trip to New York was made in eight days during which time a great deal of information was gathered on the effect of various shipping procedures on the quality of Western lettuce.

The ice refrigerated cars were arranged so the three salt practices could be compared. Comparison was also made between cars equipped with thermostats and those without control over electric fans for air circulation. Light and heavy loads and various load patterns were compared.

Water Icing Practices

Of the three salting practices compared, standard refrigeration and the two and three percent salting practices provided adequate protection for well precooled lettuce. Tests were made at the peak of the warm season. This method involves salting to two percent of the bunker capacity at initial icing and three percent of the amount of ice supplied to each re-icing.

(Researchers emphasized the importance of pre-cooling. Insufficient precooling increases the danger of freezing lettuce in certain parts of the load due to heavier salting practices used to offset insufficient precooling.)

Thermostatically controlled electric fans installed in two ice bunker cars indicated that the danger of excessive cooling is reduced through this control. The car without the thermostatic control dropped closer to the freezing point of lettuce.

Lettuce in both heavy and light loads arrived in good condition, and loading patterns did not make any difference in lettuce temperature or condition or in carton damage. There was no difference between condition of lettuce shipped in wire bound crates or in fiber board cartons.

Mechanical Car Results

Mechanically refrigerated cars used in this test were the 50-ft units. Both were of the envelope design with refrigerated air circulating around the walls, ceiling and floor. One car used forced air circulation within the compartment and the other was without.

The mechanical car with fans in the load area carried an average temperature of 36 F while the unit without the fans preformed on an average of 39 F. Average temperatures of the ice bunker cars with the preferred salt practice, was 35 F. The relative humidity of the ice bunker car was 73 percent and that of the mechanical car with fans was 90 percent r.h.

No Wilt In Either Car

The researchers reported no perceivable wilting of the lettuce in ice bunker or mechanical cars, nor could they detect any browning, decay, russet or other deterioration. Lettuce shipped at the lower temperatures appeared to have a longer shelf life after reaching the destination than the same crop arriving in the same test shipments at temperatures of 40F.

Researchers rode the rails with the test shipments from Salinas to New York. They were W. R. Barger, J. K. Stewart and M. J. Ceponis, USDA; O. A. Durrant and L. V. Anderson, railroad representatives; G.A. Peters and J. Nardonne, fruit and vegetable representatives, and R. F. Kasmier of the University of Cal.

Test load of California lettuce is temperature checked by Dr. Leonard Rygg, while Dr. J. M. Harvey records data. Drs. Ryggs and Harvey are plant physiologists, Market Research Division, Agricultural Marketing Service.

At Needles, Ariz. Walter Redit and A. L. Ryall, AMS Biological Sciences Branch check interior temperatures on a test car.

—Photos, Courtesy of Agricultural Marketing Service, USDA

BOOK REVIEWS:

Corrosion

CORROSION AND ITS PREVENTION
– 1958 Edition –
75 Cents
Air Conditioning and
Refrigeration Institute
Washington 6, D.C.

▶▶▶SIMPLIFIED and reasonably easy reading is the term INDUSTRIAL REFRIGERATION reviewers used in describing this booklet prepared by the Air-Conditioning And Refrigeration Systems Section of ARI. Not recommended as a standard or specification for the proper solution of actual job requirements, the work does summarize the types of corrosion that would be encountered in three phases of the refigerating system.

One section of the book deals with atmospheric corrosion and deterioration of system materials The second part deals with water circuit corrosion and water treatment. The third section deals with refrigerant circuit corrosion.

As if the reader hadn't received his money's worth from his 75 cent investment, the booklet also contains 11 case histories and 8 reference sources in bibliography form and a table which serves as a composite reference of suitable material for equipment components.

Operating Engineers

OPERATING ENGINEERS GUIDE BOOK
Author – C. Tom Baker
$2.75
Publisher – C. Tom Baker
Atlanta 1, Georgia

▶▶▶SELDOM in this day and age do you find an author service imbued enough to revise a number of papers given before various groups, and gather them together in a mimeographed version, available to clients, admirers and practical engineers. C. Tom Baker, at the request of numerous engineers and friends in the Southern and Southwestern ice industry, has turned out a three chapter edition of papers based on his experience as consultant to the industry. The work is imprinted on one side each and involves some 56 pages covered with a blue paper wrapper.

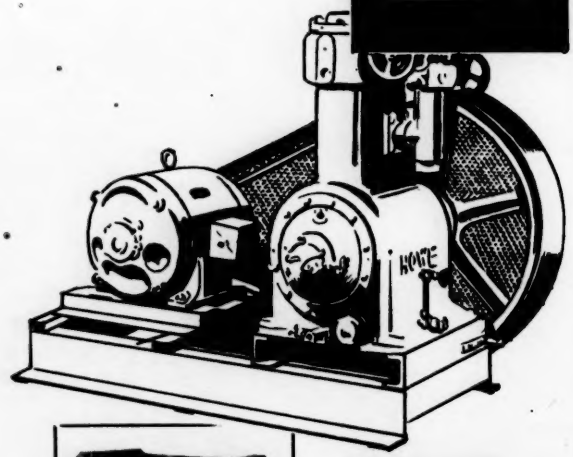
Chapter 1 of the work covers funddamentals, the physics involved in practical work around refigerating plants. Components of the refrigerating system and ice plant are covered in Chapter 2. Operating instructions and further explanation of the physical factors involved go hand in hand with the equipment description. Factors that influence plant operation such as non-condensable gases, dirty condensers, improper piping, valve leakage, insufficient ammonia charges and condensing water, and electric power are covered in Chapter 3.

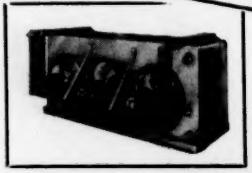
Reviewers for IR were the refrigeration engineer of a large national ice manufacturing firm and the utility engineer for one of the leading breweries in the United States. A few errors were detected but are believed to be due to typographical or production consequences. An addendum by the author would quickly correct those shortcomings. Both have placed a "do recommend" stamp on publication. They believe it will be a useful manual for practical engineers, not only in ice plants but in most every reciprocating compression ammonia plant whether it be in a brewery, a cold storage, food freezing or other industrial plant. The reviewers apparently disagree with the author that "this is no monumental work; it's just a few ideas presented by one gallus country practitioner engineer, down below the Bible belt in Georgia".

refrigeration components!

HOWE

Howe's factory facilities are especially set up to produce the custom-order fabrication of quality refrigeration components. Correctly engineered to your individual plant, they assure highest efficiency with lowest cost operation. Howe's shop flexibility gives you volume prices on small quantities with firm delivery dates.





HOWE 3-FAN UNIT COOLERS

For heavy duty, high tonnage blast freezing and freezer storage of food products.

HOWE
ICE MACHINE CO.
2829 Montrose Avenue • Chicago 18, Illinois
Distributors in Principal Cities, Cable Address HIMCO Chicago

Chemical Meet Prompts More Radiation Claims

Richard L. Francis

SENSATIONAL aspects of irradiation applications made the customary headlines in the public press during the 134th meeting of the American Chemical Society in Chicago last month. Lead-off paragraphs in articles by the feature writers accomplished more in a few lines than scientists will achieve in 10 years. Look for a new wave of rumors that home freezers and refrigerators can be discarded; refrigerated warehouses are no longer required as food banks. Canners and frozen food processors can fold up; no future for you fellows!

Appealing to the housewife, one Chicago feature writer inquired of the better half as to whether she was looking for more room in her refrigerator, and advised her to store meat on the pantry shelf! Next question she asked was whether the homemaker was always running back to the store for fresh bread and rolls. She advised your kitchen-budgeter to buy enough on her next trip to the bakery to last a year—if she can find the means to carry this quantity.

Down further in the fine print you could read that these things were not to come about yet for another ten years. However, from past experiences people connected with food processing, distribution and retailing will probably have some very peculiar questions asked of them in the next few weeks.

Experiments Reported But Status Omitted

"With proper doses of radiation, food can be kept for six months to a year without refrigeration. The shelf life of many meats has been extended five to 10 times longer. Potatoes and onions can be kept from sprouting. Bread, rolls and waffles can be kept from molding for a year or more.

"Rubber can be vulcanized without heat. Drugs can be purified in their packages. Medical supplies such as dressings, cotton gauzes, cotton swabs, instruments, and human 'bone bank' can be sterilized in the mass.

"Low gamma ray doses may increase the rate of seed mutation 10 to 100 times. In Sweden a barley with stiffer straw has been developed. In Germany bitter lupine was mutated to sweet for forage. In our country, disease resistant grains have been developed."

Half right, say a number of food technologists and scientists who should know. Although some improvements have been made, meat apparently is still not palatable. INDUSTRIAL REFRIGERATION reported in May 1956 that potatoes and beans have been kept from sprouting and grain had been irradiated in order to kill vermin.

But, widescale construction of irradiating facilities for such applications have not gotten underway for reasons of financial impracticability.

More logical, but less sensational of course, was the contention of a government official that freeze-dried and dehydro-frozen products will reach the housewife in the next half decade. In an interview over a Chicago radio station, that representative of the QMFCI, U. S. Defense Dept., pointed out the success of these applications to meat and potatoes, and to apples and peaches, not only in the laboratory, but as commercial ventures. Next came the announcement of freeze-dried strawberries and avocadoes. No atomic age glamor there, however, so it will take longer to get these in your freezer.

COMING CONVENTIONS

CANADIAN ASSOCIATION OF ICE INDUSTRIES
October 6, 7, 8, 1958
The Chantecler, Ste. Adele, Quebec

REFRIGERATION & AIR CONDITIONING CONTRACTORS ASSN.
October 12-15, 1958
Broadmoor Hotel
Colorado Springs, Colo.

NATIONAL SAFETY COUNCIL
October 20-24, 1958
Chicago, Illinois

AIR CONDITIONING AND REFRIGERATION WHOLESALERS
October 22-24, 1958
Sheraton-Palace Hotel, San Francisco

NATIONAL SOCIETY OF PROFESSIONAL ENGINEERS
October 23-25, 1958
St. Francis Hotel, San Francisco, Calif.

NATIONAL FROZEN FOOD DISTRIBUTORS ASSN.
October 26 to 29, 1958
Statler Hotel, New York City

NATIONAL ELECTRICAL MANUFACTURERS ASSN.
November 10-14, 1958
Traymore Hotel, Atlantic City, N. J.

NATIONAL ASSOCIATION PRACTICAL REFRIGERATING ENGINEERS
November 11-13, 1958
Kenilworth Hotel, Bal Harbour, Fla.

NATIONAL COMMERCIAL REFRIGERATOR SALES ASSN.
November 17-19, 1958
Golden Gate Hotel, Miami Beach.

NATIONAL ASSOCIATION OF ICE INDUSTRIES
November 18-21, 1958
Biscayne Terrace and Everglades Hotel, Miami Beach, Fla.

AMERICAN SOCIETY OF REFRIGERATING ENGINEERS
December 1-3, 1958
Roosevelt Hotel, New Orleans.

NATIONAL WARM AIR HEATING AND AIR COND. ASSN.
December 1-4, 1958
Cleveland, Ohio

NATIONAL EXPOSITION OF POWER AND MECHANICAL ENGINEERING
December 1-5, 1958
New York Coliseum, New York, N.Y.

DAIRY & ICE CREAM INDUSTRY EXPOSITION
December 7-13, 1958
Navy Pier, Chicago, Ill.

INTERNATIONAL ASSOCIATION OF ICE CREAM MANUFACTURERS
NATIONAL ASSOCIATION OF RETAIL ICE CREAM MANUFACTURERS
Conrad Hilton Hotel, Chicago, Ill.

DAIRY INDUSTRIES SUPPLY ASSOCIATION
Congress Hotel, Chicago, Ill.

MILK INDUSTRY FOUNDATION
Hotel Sherman, Chicago, Ill.

INTERNATIONAL HEATING AND AIR CONDITIONING EXPOSITION
January 26-29, 1959
Convention Hall, Philadelphia

AMERICAN SOCIETY OF HEATING AND AIR-COND. ENGRS.
January 26-30, 1959
Philadelphia, Pa.

INSTITUTE OF AMERICAN POULTRY INDUSTRIES
February 13 to 15, 1959
Municipal Auditorium, Kansas City, Mo.

THE REFRIGERATION RESEARCH FOUNDATION
April 2-5, 1959
Statler and Mayflower Hotels, Washington, D.C.

NATIONAL ASSOCIATION OF REFRIGERATED WAREHOUSES
April 5-9, 1959
Statler and Mayflower Hotels
Washington, D.C.

EDISON ELECTRIC INSTITUTE
April 5-9, 1959
New Orleans, La.

NATIONAL INDEPENDENT MEAT PACKERS ASSOCIATION
April 16-19, 1959
Palmer House, Chicago

Six King Sharp Freeze units have been installed at Carnation's milk and ice cream processing plant in Seattle, Washington.

King systems feature fast, economical, simple air defrost . . . each unit is defrosted once or twice a week . . . 20 to 30 minutes defrosting time required. King Sharp Freezing Systems are designed to maintain maximum capacity during the entire interval between defrosting periods . . . thus no reduced capacity from heavily frosted coils.

7500 square foot hardening room has King Sharp Freeze units located on one side of the room with a specially designed air distribution system.

Write today for further information,

King sharp freeze,

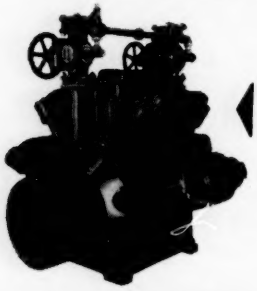
COMPANY OF OWATONNA
907 No. Cedar St. • Owatonna, Minn.
cooling, ventilating and heating systems

BIG LITTLE OR IN-BETWEEN

Creamery Package Engineering Means Lower Cost Refrigeration

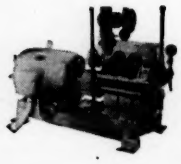
Any job—for any temperature 60° below to 40° above

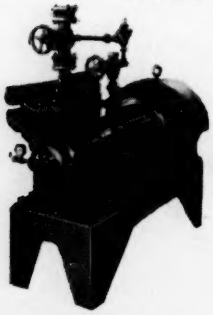
This assurance is backed by three generations of CP refrigeration know-how, advancement and *continuous user preference*. See Your CP Refrigeration Representative about your needs.



CP Type "K" Booster Compressors 4, 6 and 10 cyl. models, cap.* from 10 to 120 tons.

CP "VS" Compressors 2- 4- and 6-cyl. models in cap.* from 2 to 30 tons.





CP Type "K" Ammonia Compressors 4 and 6 cyl. models, cap.* from 10 to 200 tons.

*Depending on suction pressure.

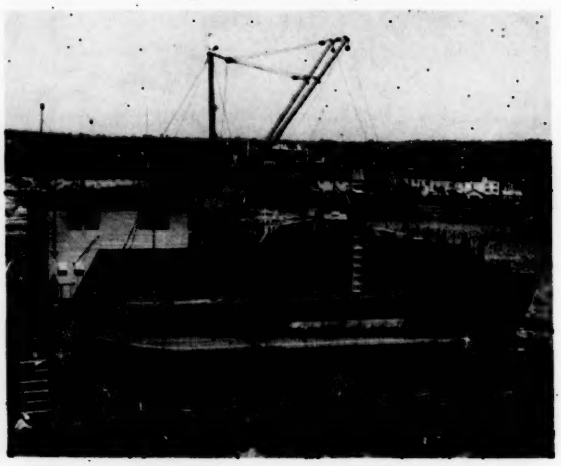
THE *Creamery Package* MFG. COMPANY

THE MARK OF DISTINCTION IN REFRIGERATION EQUIPMENT

General and Export Offices:
1243 W. Washington Blvd., Chicago 7, Ill.
Branches in 23 Principal Cities

Creamery Package Mfg. Co. of Canada, Ltd. 267 King Street, West, Toronto 2B, Ontario

Refrigerated Scow Chills Half Million Pound Catch



Jimbo, Alaska Packer's new fish scow just as it was nearing completion. Refrigeration unit is at the left center, right beneath the pilot house.

▶▶▶ MEETING competition from other seafoods and meat entrees, compels the fish packer to use every opportunity which new equipment, operator's manipulation, and personnel utilization can offer. Moreover the decline in salmon runs has made the Northwest packer's ability to accommodate the very largest catches at one time a very potent cost factor. For that reason the Alaska Packer's Company, Seattle, constructed what is believed to be the largest fish chilling scow ever built. Jimbo, a scow capable of handling 500,000 pounds of fish was recently completed for the Washington firm. The main advantage of the Jimbo is its ability to stay at sea longer, and because of its refrigerating system the fish can be kept longer.

Mechanics installing gauge lines, instruments and controls, worked in very tight quarters. Plant design made use of every available cubic foot.

Fishing ships can bring their cargo in and unload either by elevator or by brailing under the scow which can be anchored in almost any cove where the seawater is clean and clear. Fish are dumped into the hopper (visible in the scow's superstructure) and routed by chutes to the desired chilled seawater tank. This particular operation helps materially in lowering packing costs since the company no longer has to open canneries nearest any particular seasonal fishing grounds. Instead the tremendous load of fish is transported directly by the Jimbo to one of the larger canneries many miles from the original catch point.

Using York ammonia compressors and two 25-hp Graymarine diesels, designer Tom B. Miller V-belted these units for a much needed space-saving arrangement adjacent to the condenser and chiller pictured in both illustrations. Miller, assistant chief engineer of Refrigeration Engineering Co., Seattle, has designed about 24 such refrigerating units for fishing scows. However, this was the grand-daddy of them all, according to Miller.

The system is designed to reduce 60 F fish immersed in the seawater down to 30 F as fast as possible after the catch. The six-catch tanks occupy 9,000 cu. ft. All crew members have been instructed and are capable of operating the refrigeration system as well as they operate their fish handling and seamanship duties on the vessel. The tanks are also designed to carry general cargo and the scow can be utilized to handle refrigerated cargo during the off-fishing season.

Thistle Converted, Sister Vessel to Jimbo

▶▶▶ EDSEL and Nancy Peacock, husband and wife fishing team, earlier this year purchased the Thistle from the United States Coast Guard. The vessel is a sister to the Jimbo, Alaska Packers vessel, which was converted into a chilled-sea-water fishing scow. The Thistle, which was converted by the Friday Harbor Shipyards, also has a fish freezing system.

Ireland Develops Fish Processing Factories

▶▶▶ EARLY in 1958, Ireland's Minister for Lands performed official opening ceremony of the new fish processing factory on Galway Docks. The new plant is the largest of the series being erected along the Irish Coast. The Galway unit cost $154,000 to build and equip. It has a deep freeze storage capacity of 200 tons.

Built to the Sea Fisheries Board's design, the plant has a number of unique features. What is designated an ice tower is actually a gravity water supply. The water tank for the entire factory is located at the top of the tower. Beneath it is a flake ice plant, the water flowing by gravity to the ice making machinery.

Highest hygiene standards are observed in the new plant which won a contract to supply U.S. Forces in Europe. Buildings are of concrete with pre-stressed 4-inch thick roof construction. Some fish are frozen whole, while those filleted are hardened by means of contact plate freezers. Store rooms are designed for minus 22 F. In full operation the Galway plant employs 60 people and handles over 20 tons of fish per week.

Cartons of frozen and filleted fish are shipped throughout the country and markets are developing in America and Europe. Plate freezers are capable of freezing four tons of fish in 24 hours. Output of the plant is already requiring better performance of existing fishing fleet with the development of middle water trawling.

It takes practice to do this WELL!

Of course we're *good* at pipe-bends, after specializing in them since 1883. Each one of those 75 years has contributed something to the superior performance of today's

NATIONAL *Refrigeration Coils*

Progressive engineering and expert production, smooth bends and skilful welds and accurate measurements delivered . . . this is specialization that *pays off* in lower maintenance, higher efficiency, greater longevity.

Whenever *you* need coils, why not send for our free tracing-chart? It will simplify your specifications, whether for zig-zag or nested box or conical or round-flat or reducing coils. — NATIONAL QUALITY also guarantees effective service in HEATERS, CONVERTERS and HEAT-EXCHANGERS.

NATIONAL QUALITY

NATIONAL PIPE BENDING CO.

Established 1883 162 RIVER ST. • NEW HAVEN, CONN.

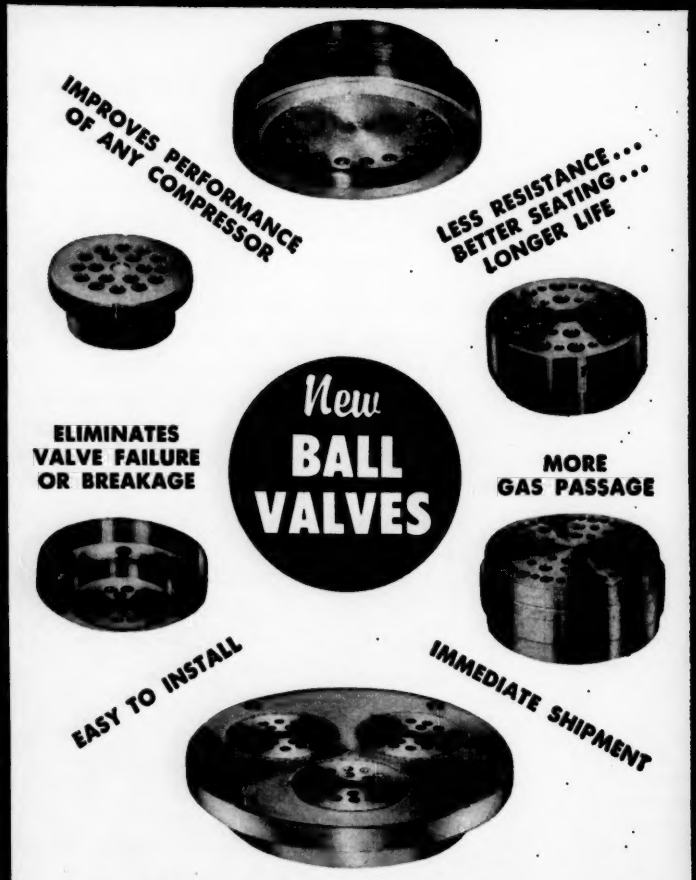
NAPRE Programs and Chapter Events

Tennessee Claims A First

MEMPHIS—Always on the lookout for something new in the refrigerating and air conditioning field, Tennessee Chapter No. 1, took advantage of an offer by NAPRE's newest sustaining Industrial Member, Armstrong Cork Company, and presented an educational audio-visual program on July 1. Pitfalls in Insulation of Air Conditioning Systems was the topic of the 40-odd colored slide presentation.

Three Armstrong representatives were on hand for the presentation and the question-and-answer session which followed. They were John J. O'Connor, Jr., Insulation Division, Robert G. Hannam, District Manager, and O. A. Howard, local Memphis manager. The chapter educational committee summed up the presentation as being really worthwhile, bringing out a lot of good ideas and information concerning proper thicknesses and competent application of pipe line and duct insulation. A number of members of RSES, ASRE and ASHAE, were present, sort of being treated to a preview of the educational data being offered by Armstrong.—CHAS. CONLEY

IN STOCK...*New* BALL VALVES
FOR MORE THAN
100 DIFFERENT COMPRESSORS



For information on improving the performance of your compressor, send us the name, bore, stroke, speed and serial number of your machine.

BALL VALVE COMPANY
5512 OAK STREET • KANSAS CITY, MO.

Lebanon (Pa.) Brewery Dutch NAPRE Treat

LANCASTER—Southeastern Pennsylvania Chapter, NAPRE, held its first away-from-home meeting on May 28. Since the membership area of the chapter extends over a 35 mile radius around Lancaster, it is the desire of the Board of Directors to hold a series of meetings each year in the various cities within that area. Upon the invitation of Sergeant-at-Arms Warren Tice, the members journeyed to Lebanon, Pa., to be the guests of the Lebanon Valley Brewing Co. Tice is the chief engineer for that company.

Members making the visitation included Melvin Burkholder, Victor Weaver, Inc., New Holland, Ben Mowyer, Penn Dairies, Inc., Charles Golin, Lancaster Packing Co., Paul Ament, Turkey Hill Farms Dairy, Milton Rambo, Consumers Packing Co., Jack P. Sawyer, Armstrong Cork Co., all of Lancaster; Noah Getz, Getz Bothers, East Petersburg, Martin Strine, York Cold Storage Co., Frank Kain, York Ice & Milk Co., Christian Frank, York Corp., Vaughn Lefever, P. Tassis Co., Lovett Wyche, Freezing Equipment Sales, Inc., all of York, Pa.; Odell Drake, Consumers Ice Supply Co., Lebanon, Pa., Norman McMullen, Consumers Ice Co., Columbia, Pa. There were several guests.

Although the Lebanon Valley Brewing Co. ranks among the older breweries of the country (it is nearly one hundred years old), the equipment and the methods of production are very modern in every respect. One piece of refrigeration equipment which seemed to draw the most interest was a Frick 3x3 ammonia compressor complete with condenser and liquid receiver in one unit. To these NAPRE engineers who are accustomed to much larger compressors, this was a "wrist-watch of compressors".

Following the tour through all departments, from the raw material to the finished product, the members retired to the recreation room where this finished product was dispensed, to the enjoyment of all, along with plenty of food.

Author Featured Speaker

Two meetings were held in June. Educational session June 11, was devoted to lubrication. The chapter was very fortunate to have as its guest, Raymond C. Gunther, author of REFRIGERATION, AIR CONDITIONING AND COLD STORAGE. Gunther conducted the educational session with a talk on lubrication, followed by a lively discussion with practically all of the members present taking part.

The speaker is currently associated with the Socony-Mobil Oil Co. at Philadelphia. He is a Pennsylvania Registered Professional Engineer and Colonel in the United States Army Reserve. Other achievements mentioned in his introduction were affiliations as member of ASRE, NSPE, The Association of Iron and Steel Engineers, the American Society of Lubrication Engineers, and former officer-in-charge, Refrigeration School, Army Training Center.

Gunther did not attempt to cover the subject of lubrication in such a short time as one evening session. However, he did cover basic or fundamental principles of lubrication, stating that the main reason for lubrication was to overcome friction. Friction, he noted, was grouped into three types; namely, solid, roll, and fluid. Friction was also the source of heat and that certain methods of applying the lubricant would remove this heat. Generally speaking, the heat from friction is equal to the ratio of input and output.

Illustrating on the black board several kinds of friction, speaker Gunther used as examples the common bearing, (1) rotating, (2) reciprocating (sliding) and (3) thrust. He also listed many kinds of gears but very little time was spent with them.

Lubrication Forms

Under the heading of "Phases of Lubrication", three were mentioned; namely (1) "Mixed Film", which was explained as a very minute quantity, such as oil from ones hand; (2) "Boundary Film", such as lubrication from a squirt can; this being an up and down method, or first you have lubrication and then you do not have lubrication; (3) "Flooded Film", meaning plenty or full lubrication, such as a shaft running in a bearing that is submerged in oil.

Final few minutes of the session were devoted to the viscosity of oils and how various Saybolt Seconds were grouped together to form the S.A.E. rating; and how the various names such as light or spindle, medium, heavy, cylinder oils etc. came about.

Purging Discussion

The educational session on June 25 was conducted by the chapter instructor Milt Rambo and was devoted entirely to an open discussion on the question "Correct Purging Points". Program was prompted by item in Question Box, June '58, INDUSTRIAL REFRIGERATION. The general consensus of the members present was presented in the form of a letter by the chapter secretary to the Editor. From the views presented by some of the members it is quite obvious that this subject could be presented in a series of several meetings to cover all the discussion angles.—S. M. RAMBO.

Local Editor Presented At Mississippi Meeting

JACKSON—Guest at the July meeting of Mississippi No. 1 Chapter, NAPRE, was Louie Coward, Sr., founder and editor of THE COOLER. Making its debut in August, THE COOLER is a trade journal published exclusively for air conditioning and heating specialists in Mississippi. With a career dating back over 30 years in the refrigeration and air conditioning field, Coward has launched a state wide publication to serve the local industry in a more specialized way than could be undertaken by publications providing a nationwide coverage. The first issue of THE COOLER devoted practically a full page to NAPRE, the Mississippi officers, objectives.—R. H. STEWART.

Marine Inspection at S.F.

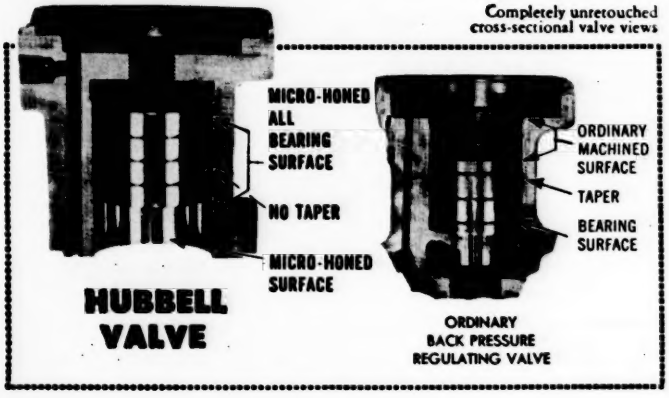
SS LURLINE—Matson Lines was host to California Chapter No. 1 members and their ladies on August 16 when this NAPRE chapter made a two hour tour of the SS LURLINE. Public relations representative, R. F. Sollie, was host.

Although the engine room was the feature interest for members, the bridge also held considerable attraction. Stops were made on the tour which also held substantial interest for the ladies, such as the galley, dining salons, cocktail lounge, card rooms, reception rooms, ballrooms, theatre, suites, shopping center, swimming pool, promenade.

Much enthusiasm was shown by both men and women over the array of apparatus and instruments on the bridge. Explanations were made of each instrument, covering the control features and the safety aspects for making the passenger's voyage pleasant and safe. To those who are not familiar with marine navigation, it was an unexpected pleasure to learn from Sollie and the ship's navigator just how the USS Nautilus managed to navigate under ice caps in an unchartered sea without running aground in shallow water.

Following the tour, most of the members and their wives enjoyed dinner at Fisherman's Wharf. —LEROY ETZEL

who said "trouble-free" valves ?



We did. And it's no empty expression. Hubbell valve piston and cylinder walls are *micro-honed to a .0002 tolerance.* Why? Because this makes possible a "*wiping action*" of the surfaces which will not permit particles even as fine as emery dust to enter between valve piston and cylinder walls to cause cutting or sticking. It completely eliminates "tapered" or "egg-shaped" surfaces that result in costly down-time.

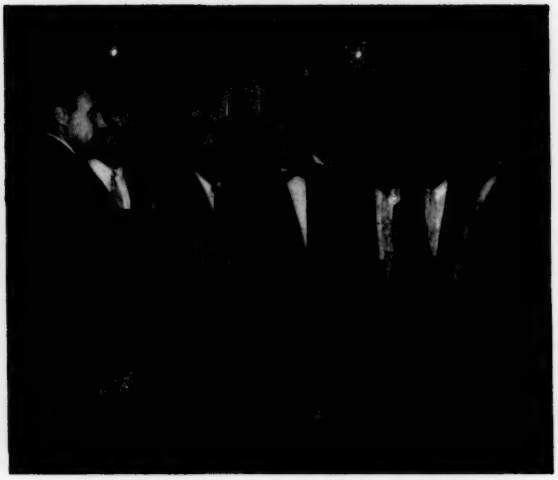
• *Micro-honing* is another Hubbell craftsmanship extra that means trouble-free service for you. Next time specify Hubbell . . . and you'll discover the difference precision makes.

E. B. LaPlante
GENERAL MANAGER

HUBBELL CORPORATION
MUNDELEIN, ILLINOIS
BACK PRESSURE REGULATOR VALVES • DUAL PRESSURE REGULATOR VALVES • AUTOMATIC SUCTION STOP VALVES • SOLENOID VALVES • GAUGES • SAFETY RELIEF VALVES

"Castings to finished controls . . . every inch HUBBELL!"

New Officers In Eastern Missouri



St. Louis' candid cameraman paused long enough from his own dancing to get an expression of enjoyment from the nearest dancers. K. M. Holaday, past national president, installed the new officers of St. Louis chapter. Accepting Holaday's congratulations on the extreme left is Wilson Hanebrink, president. Next is Clarence Johnson, v.p., Ed. P. Hughes, secy., and behind Holaday's left shoulder is Eugene Kessler, past chapter pres. and dir. Continuing: Harry Crall, treas., Peter Orlando, past chap. pres. and dir., and Roy Cameron, sgt.-at-arms.

ST. LOUIS—Gala is the description attached to the annual dinner and installation of officers of St. Louis, Mo. Chapter, NAPRE. Taking place late in May, the presentation of the new officers was followed by dancing. In addition to the dinner and dancing, members presented their wives with corsages, a tradition.

New officers are: President, Wilson R. Hanebrink, Merchants Refrigerating Co.; Vice-President, Clarence Johnson, Falstaff Brewing Corp.; Secretary, Edwin P. Hughes, Millstadt Creamery Co.; Treasurer, Harry Crall, Star Iron & Metal Co., Sgt.-at-arms, Roy Cambron, Thermal Eng'r'g. Co. Directors are Kenneth M. Holaday, Eugene Kessler and Peter S. Orlando, all past chapter presidents.

Plans Fall Program

New in the job of president, Hanebrink is setting a stiff precedent for his successor. Although the chapter is recessed for the summer, prexy Wilson assured continuous work by officers and committees on the Fall and Spring programs by appealing to the inner man, and entertaining his better half. On July 12 he entertained the chapter officers, committeemen and their wives in his own home, serving a bar-b-cued chicken dinner and the customary summertime refreshments. Dancing was enjoyed later in the evening.—ED HUGHES

Pitt Chapter Tours Brewery

Closing shop for the summer, Pittsburgh Chapter, NAPRE, met late in June at the Iron City Brewery Co. Refrigeration education in the class room gave way to a movie on the making of beer. The film depicted early days in the brewing art and brought the viewer to modern times. Members were pleased to note that the film did picture the importance of refrigeration and how it served this beverage industry so well.

Also of interest to the members was the fact that this product contributed much in the way of internal revenue for our government as compared with the non-tax status of NAPRE. The Association being a not-for-profit one is indirectly benefitted by this industry. The usual tour followed and was concluded with refreshments.—OTTO KNOCH

Social Starts Season For Northwest Chapters

TACOMA—Washington No. 2 NAPRE started Puget Sound Chapters off in their Fall meetings by inviting Olympia and Seattle groups to a social at the Heidelberg Brewery in Tacoma. Dinner was served at the "Top of the Ocean" and Archie Waterbury, Past President and Chief of the brewery was chairman.

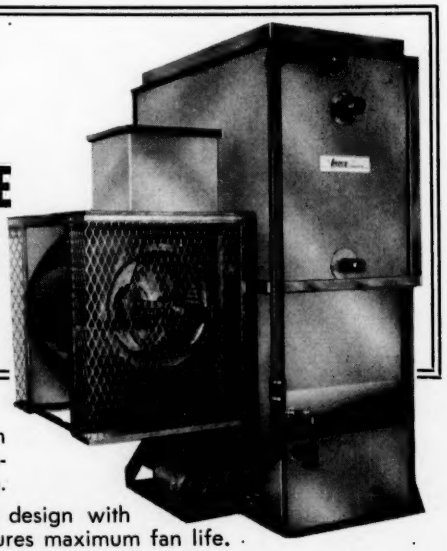
Preceeding the social affair, there was a short meeting of the Northwest Educational Conference Committee. All Puget Sound Chapters had representatives at the meeting and plans were started for a northwest educational session again this year.—JIM BENNETT

New!

LARGE CAPACITY

EVAPORATIVE CONDENSERS

capacities up to 300 tons



RUGGED CONSTRUCTION—heavy welded construction and hot dip galvanizing assures long trouble free life.

LONG FAN LIFE—blow thru design with fan handling dryer air assures maximum fan life.

FULLY ACCESSIBLE—the eliminators, pump strainer and float valve are all accessible from the outside.

SUPERHEAT—separate, efficient coil for superheat removal available.

SAVES WATER
SAVES COMPRESSOR HORSE POWER
SAVES INSTALLATION COST

Imeco Incorporated

Write for Bulletin 958

Phone: JUniper 8-7117

3033 W. Belmont Ave., Chicago 18, Ill.

Downing to Retire Recalls Experience

TULSA—It takes a retirement or equivalent to get some of our national officers better acquainted with our membership. Warren C. Downing, Tulsa chapter member, asked to withdraw his membership, indicating that he planned to retire in December. Such a request, of course, always brings a regional director into the picture.

That is how this correspondent got acquainted with Downing. This member, although he had only eleven years in the Association, apparently got a great deal out of his membership; but, more important, it is apparent that he contributed perhaps more to the instruction and inspiration of younger men.

At right—
Member Operates Own Development

Downing began work at the old Western Ice Company at Shawnee, Oklahoma, 1919. He relates that he worked twelve hours a day on the night shift until 1924 when he moved to the Prague Ice Company and helped build a new addition to that city's plant. In 1927 he moved to Seminole where he helped build another plant.

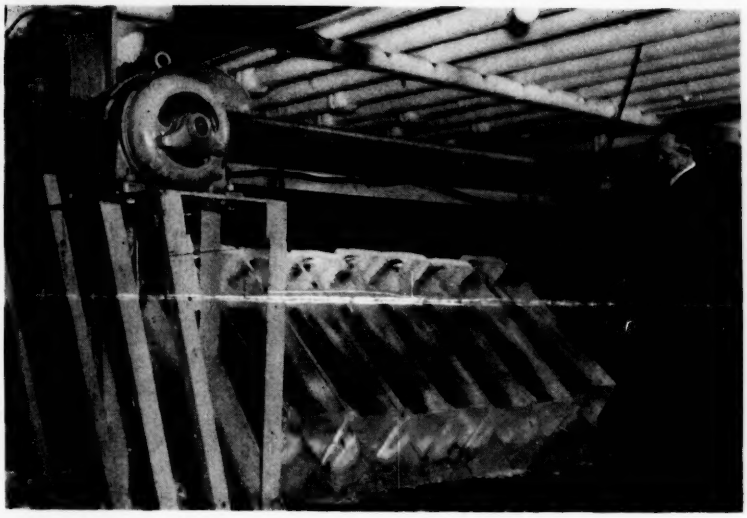
Downing moved to Tulsa in 1938 and helped build and then operated the Denver Ice Plant until they sold it to People's Ice Co. of Tulsa. He was chief engineer of People's plant until 1953 when they sold out. At that time, he went to Beatrice Foods as engineer.

Thankful For Health

According to this member, he has worked all these years without losing any single week from sickness. He is thankful for his health and indicates he gets a physical checkup every year. Although he will be of retirement age in Dec., he still has hopes that his firm will not let him go.

Downing emphasized a couple points which National President Chase made in his August message. Photo accompanying this article makes his point better than this correspondent could describe. With the machine pictured, and a flip of the wrist, Downing writes, eight 300 lb. cakes of ice can be lifted at one time. Ice elevators may be nothing new in the industry but the fact that this machine was assembled and manufactured on the job by Downing is of considerable significance. A materials handling job had to be accomplished, priority was too tight for an immediate solution to the problem, so the chief engineer put his know-how to work.

Using a 5 hp motor which was available, plus odds and ends of steel and machine parts, Downing went about fabricating and assembling the machine pictured. It took two weeks but according to this NAPRE member, it is typical of an American engineer's ingenuity. The machine lifts and stores the cakes of ice in an upright position in the vault. A 3 hp motor could do the work but a 5 hp was all that was available. The fete was accomplished during the 1945 ice season.—JOHN MULLER



Annual Watermelon Party

Memphis—A ton of famous W. A. Hunt watermelons were gobbled up by members, their wives, children and friends at the annual watermelon festival sponsored by the Tennessee Chapter. The affair was held in the air conditioned break-up room, Mid-South Refrigerated Warehouse Co. The hot weather in mid-August made the air conditioned facilities and the watermelon a real treat.

The Chapter resumed meeting twice a month on the first Wednesday of Sept. As the older members had completed the BASIC REFRIGERATION course last Spring, it was planned to start the course over again since a number of new members had come into the Chapter and it would be helpful to them. Jack H. Berry was the first new member elected to membership this Fall. He is Assistant Engineer, Methodist Hospital.

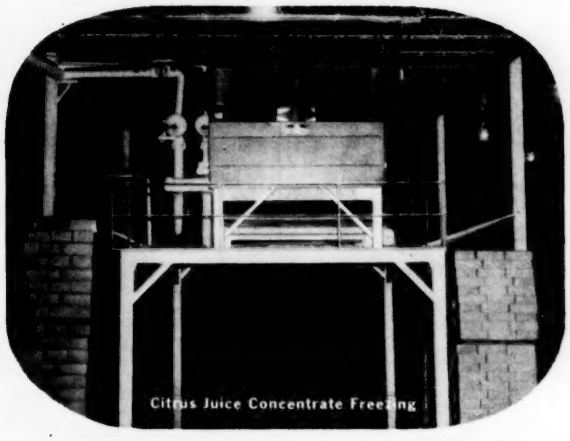
—CHAS. CONLEY

NIAGARA "no frost"

25 Years Successful Experience

★ *Never any defrosting shutdown*

★ *Never a rise in temperature*



NIAGARA BLOWER COMPANY

Dept. IF-10, 405 Lexington Ave. New York 17, N.Y.

Niagara District Engineers in Principal Cities of U. S. and Canada

There's a Place in Your Planning For Kohlenberger Engineering

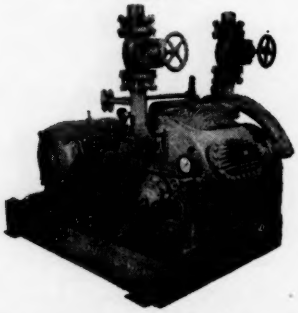
Kohlenberger's extensive manufacturing facilities and experienced staff make it possible to offer industry a *complete* service in the development and installation of heavy duty industrial refrigeration and air conditioning equipment.

For 36 years Kohlenberger Engineering Corporation has built its reputation on the dependability and quality of its equipment and the skill and integrity of its engineering staff.

Kohlenberger services include:

Equipment Manufacture
Refrigeration System Design
Plant Layout
Field Erection

When quality and dependability count ... contact Kohlenberger!



Kohlenberger heavy duty high speed industrial refrigeration compressor for ammonia and freon refrigerants.

Write for free illustrated brochure.

KOHLENBERGER ENGINEERING CORPORATION

1610 Commonwealth Avenue, Fullerton, California

Old Timers' Pictures Catch Up With The Press

Cameraman George Paulick, national officer of NAPRE, flew to Spokane to install that chapter leaving his film in the camera. Old timers who posed for this picture had looked for it in the September issue. Left to right, M. E. Bell, Frank Elliot, Ralph E. Manns, Herb Royden, W. R. Burnett, E. T. Quinn, and newest member W. J. Bower. Scene: Mission Room, Pabst Brewery, Los Angeles. Old Timers' Night is held annually at the close of the chapter season, which is actually mid-year. The Ham and Beans dinner opens the season in the Fall.

Emcee Bill O'Connor presents Hiroshi Takusagawa with table model radio, first prize.

Mid-South Honors Two Members

MEMPHIS—Tennessee Chapter NAPRE members are certainly proud of two members who were prominent in local and national news lately. Dean W. R. Woolrich, University of Texas, retired as Dean of the engineering school. He had much to do in the early years of the Memphis Chapter in getting its educational program well established. The Chapter is pleased to note his accomplishment in being able to retire and to devote time to his many other refrigeration interests throughout the world (a detailed news announcement on the Dean's retirement appears on page 41).

Perhaps the oldest member in NAPRE and certainly the oldest one in Tennessee Chapter, is Charles H. Stanton who celebrated his 90th birthday, Sept. 6. His folks invited old friends and gave him a surprise party. Stanton doesn't look his age and his health is good in spite of the broken hip he sustained a few years ago which requires him to use crutches. Although he retired as Chief of the Peabody Hotel some years ago, his office is still maintained in the hotel's engine room and he visits it three or four times a week.

Stanton was born in 1868 in Clayton, Indiana, completed school in Indianapolis in 1884 and entered Earlham College at Richmond, Ind. On graduation he moved to Decatur, Alabama working for American Extract Works. At one year intervals, he moved successively up the ladder.—CHAS. CONLEY

Los Angeles NAPRE Tours New Facility

COMPTON — An inspection tour of the Westinghouse Electric Corp.'s newest manufacturing and repair facility was participated in by 60 members of California Chapter No. 2, NAPRE, in June. The tour afforded engineers an opportunity to observe first-hand how many of the electrical devices used in industrial refrigeration systems are manufactured, repaired and serviced; such as industrial motors and their controls, transformers, switch gear, panel boards and industrial control centers. The Manufacturing and Repair Div. is located at 18020 S. Santa Fe Av., Compton, a Los Angeles suburb.

B. J. Sturmer, Jr., manager of the plant, headed a staff of engineers who guided the NAPRE visitors through the new plant in groups of 10 or 12. Those staff members included: J. E. D. Morris, plant superintendent; R. L. Bell, engineering manager; R. S. Harries, repair foreman; K. T. Shaw, maintenance sales supervisor; and E. J. Lawrence and John Hollinger, maintenance sales engineers.

NAPRE tourists learned from Sturmer that the Compton facility, which was opened for operation in March 1958, is one of six Westinghouse M&R plants in the West and 40 in the nation. The Compton operation provides a straight-line production flow for new electrical apparatus (see Fig. 1), and inspection and repair facilities for transformers and large rotating equipment (Fig. 2).

Electric Motor M&R Plants A Service Must For Sales

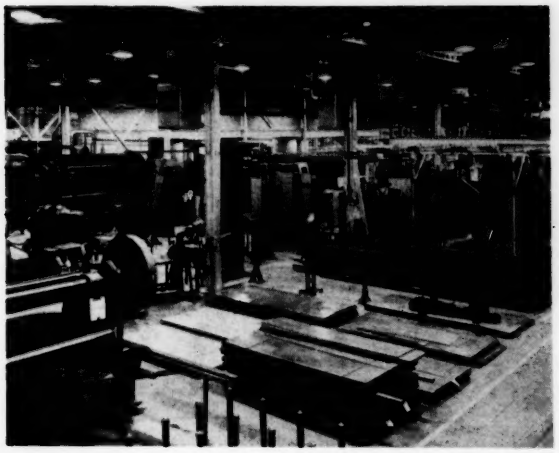


Fig. 1. Members of Los Angeles Chapter, NAPRE, in touring the new Westinghouse plant were shown, among other things, the sheet metal section depicted in this photo from which flow of new products starts.

Fig. 2. View of the main M & R aisle in the new Westinghouse Electric Corp. plant where repairs to power and distribution transformers, large rotating electrical apparatus, panel boards, switchgear are done.

Motor Repair Interest

Sturmer explained that improved methods have expedited industrial motor repairs, reducing the "turnaround" time for customers in Southern California, Arizona and Southern Nevada. Turnaround is the time required to receive, inspect, dismantle, rewind, paint and ship a motor from the truck docks or railroad spur inside the building.

In the motor repair division, NAPRE'ers were shown how the Compton plant is equipped to repair motors ranging from fractional horsepower sizes to as large a motor as can be moved economically from a jobsite. The plant repairs generators, converters and other rotating apparatus, and also does general machining, dynamic balancing and heavy press work. Crane facilities, at various levels under the 38-ft high bay ceilings range from 10-ton to two-ton.

General Manager Sturmer and his staff served as hosts to the NAPRE visitors at a refreshment period in the plant after the tour.—Fred Herr.

NOW FASTER BUNKER ICING AT LESS COST

with new Mobil Icer

Truck-mounted Mobil Icer operates in railroad yards, on sidings, at shipper's docks, anywhere a truck can go.

ADAPTABLE TO ALL BUNKER ICING OPERATIONS

Saves valuable time on every job. Eliminates shuttling of cars and break-up of trains for icing. Also, most efficient for icing cold storage bunkers and pre-cooling chambers.

FAST TWO MAN OPERATION

Mobil Icer easily handles 300 lb. blocks of ice at the rate of 20 per minute. Twin-drum design uniformly breaks blocks of ice to ideal size for bunkers (approximately 37½ lb. cubes) or delivers coarse crushed ice for topping off bunkers.

Get the full money saving story. Write for FREE literature today!

THE CONVEYOR CO.
ENGINEERS AND MANUFACTURERS
3260 E. Slauson Avenue • Los Angeles 58, California

BOWER
BB BRAND
AMMONIA

ANHYDROUS AMMONIA

Over a Century of Service in Chemicals

1855-1958

Please Send for Our Latest Booklet, Anhydrous Ammonia Which Gives Helpful Hints for the Plant Manager

HENRY BOWER CHEMICAL MANUFACTURING COMPANY
29TH AND GRAY'S FERRY ROAD
PHILADELPHIA 46, PA.

WHAT'S NEW, *Continued*

Self-Extinguishing Foam By Armstrong Cork Co.

INSTALLED in any cold room by standard cold adhesive methods SE Armalite is a new extinguishing polystyrene foam insulation by Armstrong Cork Co. Said to combine light weight, good dimensional stability and high insulating efficiency, the material can be used for railroad tank cars, refrigerated truck trailers, insulated containers, refrigerators, perimeter and cavity wall insulation and is an excellent plaster base.

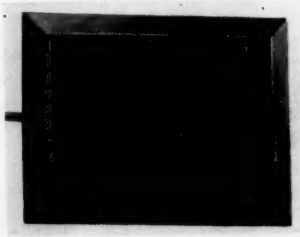
Door-O-Matic

AUTOMATED door control is as easily facilitated in the refrigerated warehouse or walk-in refrigerators where swinging doors are used as it is with conventional building access doors. Said to be an easy and inexpensive installation, the Door-O-Matic is manufactured by a Philadelphia firm. The device is actuated on any air system between 50 and 150 psi, and 110 volt ac supply. Plant maintenance personnel are capable of installing this accessory.

Corrosion Preventive

CORROSION INHIBITING liquid Neoprene protective coating with a built-in primer is an unusually new product announced by a Charleston, S. C., firm. The material can be brushed, rolled, sprayed or dipped, and is used on refrigerating equipment for corrosion protection which is flexible to impact.

Foot Switches



ACTUATE that automatic door opener with the Neptune electric foot switch. Completely water-proofed construction, these switches are designed especially for use on electrically controlled devices.

Neoprene-"Dacron" V-Belt Introduced

ENTIRE production of industrial V-belts by a Boston company has been shifted to a new construction of neoprene with "Dacron" polyester fiber. Available commercially in July, the belt is marketed both for original equipment and replacement use. The new belt is intended to give the design engineer more latitude by providing greater longitudinal flexibilty while at the same time giving transverse rigidity, and to help the maintenance man by permitting lower inventory and reducing matching and take-up time.

Reinforcing cords of "Dacron" offer high strength to absorb more shock loading, flexibilty, length stability following changes in humidity, and resistence to abrasion, heat, oil, acids, and alkaline materials. Neoprene, used in the cover and compression member, provides greater resistance to oils, heat, abrasion, chemicals and ozone. The new belt is expected to gain widespread acceptance in power transmission fields such as petroleum, chemical and food processing, power and electrical utilities, and textile and equipment.

Urethane Foam In Varied Densities

URETHANE foam may be formulated to almost density in less than one to more than 40 lbs per cu. ft, and may be flexible, rigid or semi-rigid. Uses range from crash padding and furniture cushions to structural members and insulation. Rigidity of the foam is achieved through proper formulation.

To demonstrate the impact-absorbing characteristics of various urethane foams, chemists at Allied Chemical Corp.'s Applications Research Laboratory, Buffalo, New York, used two walnuts, a wooden mallet and two samples of national Aniline Division's *Nacconate* isocyanates. Polyester urethane of 1.7 lb density absorbed the heavy blow from the mallet without harm to the walnut. The rigid 5-lb dense foam had the opposite results. The nut shattered.

K. G. BROWN INTRODUCES THE NEW MULTI SCREW VENDOR FOR 1958

PROFIT-MAKING PACESETTER in AUTOMATIC ICE VENDING
More Sales + More Storage + Less Cost + Less Servicing

- An increased capacity of 40% over previous models.
- Multi Single Line Vending of any size package or block, regardless of the type of tie.
- These new vendors are now made in lengths up to 20' which will vend 268 10# bags plus 132-25# blocks out of the same delivery door, (400 Sales).
- Up to 5 various sizes of blocks or bags can be vended from this one vendor.
- Radical invention, trouble free, more storage space by design, lower operat oneal cost.

NEW LOW COST 6' x 8' station vends 110-10# packages, or the "Junior", 3' x 7' station vends 90-10# packages using the new multi screw vendor.

ILLUSTRATED 9' x 16' Station vends 168-10# bags and 86-25# block.

K. G. BROWN MFG. CO., INC., MATTITUCK, N. Y.

Personnel News Around The Industry

Anderson Central Manager For Creamery Package Mfg.

ADVANCED from Minneapolis Branch Manager to Central Zone District Manager of the Creamery Package Mfg. Company, is Dwight L. Anderson. This recent announcement came from H. J. Kerr, Director of the firm's branch operations. Anderson will continue to maintain his headquarters in Minneapolis, supervising Waterloo, Omaha, Kansas City, Twin Cities branches.

Anderson joined Creamery Package in 1937 at the Omaha branch. Prior to that he was with Fairmont Foods Company, Omaha, and Sunrise Creameries, Cheyenne, Wyo. He is a graduate of the University of Nebraska.

Jones With Imeco

IMECO, INC. of Chicago and Polo, Illinois, on August 1, announced the appointment of R. S. Jones as general sales manager for its increasing line of refrigeration and heat transfer equipment. Jones has been active in the refrigeration industry since 1939 as a district engineer in the Chicago office of Niagara Blower Co. He is a graduate of the Unversity of Michigan.

A. W. Newton, Director of Engineering, York Div.

ALWIN B. NEWTON has been named Director of Engineering of York Division, Borg-Warner Corp. In this capacity Newton is responsible for all research and product development at York, embracing room air conditioners, heat pumps and residential air conditioning as well as components for large refrigeration and air conditioning systems for office buildings, industrial plants, hospitals and similar applications. He returns to York after an absence of some 25 years since he started his career in the air conditioning and refrigeration industry as a college graduate engineer student in the York Institute in 1932.

Woolrich Now Emeritus, Continues As Professor

PROF. W. R. WOOLRICH, College of Engineering, University of Texas, retired as Dean on September 1, after serving 22 years. He will continue his connections with the University as a special consultant on engineering education to the president of the University and also as a professor of mechanical engineering. He is succeeded by Dean W. W. Haggerty of the University of Delaware.

ENGINEERING-SCIENCE NEWS, published by the College of Engineering and the Balonces Research Center, University of Texas, in describing the Dean's retirement, stated that it took two men 70 years to put the University's College of Engineering together, develop it and refine it into the precision educational institution that it is. In this 70 years of nearly 9,000 students graduated, over 6500 of the diplomas were signed by Dean Woolrich. Woolrich's predecessor, the late Dean T. U. Taylor, created the department and then the college.

Refrigeration Expert

Although Woolrich has been known for his personal interest in research in the various engineering branches, he is perhaps best known for his contributions to refrigerating science. He has written more than 100 bulletins, technical papers and technological reports in his special field. Outside research connections are so numerous that the University's publication made no attempt to list them in reporting his retirement.

He is a special consultant on research grants to the U. S. Department of Commerce and the National Science Foundation. He is a board member of the National Research Council and a consultant to the U. S. Department of the Interior on research in the conversion of saline water into fresh water by the freezing process.

At present Woolrich is serving as Vice-president of the International Institute of Refrigeration, on Commission 9, which deals with refrigeration education. (He will attend that group meet in Paris in Nov.) Woolrich has also been a most active member of ASRE serving on many committees and presenting many papers. He was also an abstractor for the Society's Refrigeration Abstracts.

Practical Interests

A very busy professional man and educator, the Dean also found time to assist the practical engineer who sought to increase his refrigeration knowledge. A member of NAPRE for 32 years, the Dean first became affiliated with the Association in Memphis, where he served Tennessee Chapter No. 1 as an instructor. Over the 22 years that he has been at Austin, Texas, he has never lost contact with NAPRE and has maintained his membership in his original chapter.

Prof. W. R. WOOLRICH

Woolrich is also a contributor over the years to INDUSTRIAL REFRIGERATION, and is author of the HANDBOOK OF REFRIGERATING ENGINEERING by the D. Van Nostrand Co. As if this review were not sufficient to picture the stature of the man, it might be added that he even served a year in the Court of St. James as Chief Scientific Officer of the American Embassy.

Rassweiler Heads Chemists Bailer Slated Successor

CLIFFORD F. RASSWEILER was confirmed as president of the American Chemical Society at the groups' 134th meeting held in Chicago, September 7 to 12. Rassweiler, Vice Chairman of the Board, Johns-Manville Corp., in a by-lined article in the JOURNAL OF COMMERCE, and in various interviews, advocated a fourth service in the Defense Department. He recommended that the Defense Research activities in the Army, Navy and Air Force be removed from those operating services and to establish them as a fourth department. He stated equivalents as having been decided by industry as early as the 1920's, taking research and development away fom operating departments in major industries.

JOHN C. BAILAR, JR., Professor of Inorganic Chemistry, University of Illinois, is president-elect of the American Chemical Society.

Hess, Greiner, Polland In New San Diego Office

SALES ENGINEER Bill Sullaway has been appointed head of the new Hess, Greiner and Polland Sales office at 3150 El Cajon Boulevard, in San Diego, California, it was announced late in July by A. J. Hess, President. As Sales Engineer for H. G. & P., heat and power equipment company, Sullaway will handle Recold air conditioning equipment, Anemostat air diffusers, Waterloo Grills, registers and Continental air filters.

Bell Relocates

MORTIMER E. BELL & Associates have relocated to 13636 Don Julian Road, LaPuente, Calif., from their recent Arcadia headquarters. Bell, former supervising engineer for the Sick's (Brewing) Enterprises, retired earlier in the year to establish a firm of registered professional engineers specializing in air conditioning and industrial refrigeration consulting.

WORLD'S LARGEST MANUFACTURER
ICE CANS and BASKETS

- GALVANIZED
- WELDED
- RIVETED

Ohio Special Ice Cans are fabricated from finest quality Prime Galvanized Steel Sheets; formed accurate to size and straight for fast harvesting of ice.

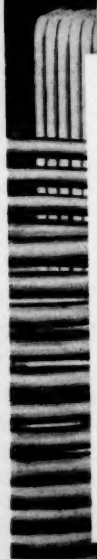
Ice Can Grids or Baskets are designed to lift any number of ice cans and are Hot-Dip Galvanized after fabrication.

Write for Prices

OHIO GALVANIZING & MFG. CO.

ANN ST., NILES, OHIO, U.S.A.

PIPE BENDING EXPERTS



Coils, Headers, Fabrications

Completely modern metalworking machines, plus over 37 years of "know-how", assure the finest work to your exact specifications. Proven specialists in custom bending in any form, any metal, even stainless steel.

May we quote on your next job?

CHICAGO NIPPLE MANUFACTURING CO.
1997 CLYBOURN · CHICAGO 14

MANUFACTURERS' NEWS

Jordan

Enos

Neidermeier

Sporlan Moves Three

SPORLAN VALVE CO. in August and September announced three personnel changes. R. E. Niedermeier was promoted to product sales manager for thermostatic expansion valves and refrigerants distributors. Herold S. Jordan and Tom Enos were transferred to Kansas City and Los Angeles offices of the firm, respectively.

Niedermeier, formerly serviced the Kansas City territory and is now located in the home office of the firm at St. Louis. Jordan has been placed in charge of the Kansas City office. Enos was transferred fom St. Louis to Los Angeles to replace Jordan.

A graduate of Evansville, Indiana College, Niedermeier has been with Sporlan as a sales engineer since 1954. Jordan and Enos are graduates of California State Polytechnic College, San Luis Obispo.

New Barada & Page Outlets

BARADA & PAGE Inc. late in August announced the opening of a new branch office and warehouse at Baton Rouge, Louisiana. Five chemical and equipment companies in Indiana, Tennessee and Illinois were designated distributors for "National" Anhydrous Ammonia, one of the products of Barada and Page, Gas Cylinder Division. At Evansville, Ind., Barning Industrial Chemical Co. and at Fort Wayne, Ind., Fort Wayne Dairy Equipment Co., were appointed distributors. Chapman Chemical Co. at Memphis, is the Tennessee appointee. Mid States Chemical Co., Mount Vernon, Ill., and C. P. Hall Co., Chicago, Ill., represent the firm in that state.

Kramer Institutes Suit On Winterstat Patents

PATENT infringement suits were instituted by the Kramer Trenton Company in a Federal Court against Melchior, Armstrong, Dessau Company, Inc., a wholesaler in Ridgefield, N. J. The complaint alleges infringement of two patents, and Kramer Trenton seeks preliminary and final injunction against further infringement, plus an accounting of profits and award of damages for each infringement, and court and counsel fees. Patents involved cover Kramer Trenton Winterstat Systems.

Tynan To Dunham-Bush

APPOINTMENT of John W. Tynan as heating products sales engineer in the Cincinnati area, was announced by James A. Mulcahey, vice-president of sales, Dunham Bush, Inc. An OSU graduate, Tynan was formerly associated with Hall, McAllister and Stockwell.

New Manager For General

GENERAL CHEMICAL Division, Allied Chemical Corp., announced in August the appointment of Fred C. Hitchings, Sales Manager for refrigerants and aerosol propellants. With the company for 24 years, Hitchings has been manager of New York metropolitan sales.

Bomanz With Larkin

LARKIN Coils, Inc., of Atlanta, Ga., is now represented in the Chicago sales area by Carl J. Bomanz. Formerly a represenative of a valve and control manufacturing firm, Bomanz has his sales office located in Arlington Heights, Ill.

Ball Valve Company Ships From Stock

INTRODUCED nationally to refrigerating and other industries employing compressors, the new "BV" ball valve has proven popular as a replacement for plate and poppet types. Acceptance of the product has been such that production has been expanded to supply types and sizes for approximately 100 different makes and sizes of compressors. To better serve its increasing list of customers, Ball now stocks valves for ready shipment. The Kansas City, Mo. firm has a combination price list and chart which indicate the valve numbers interchangeable with other makes.

Armour NH_3 Division Opens Third New Plant

THREE new anhydrous ammonia cylinder filling plants have been opened by the Ammonia Division of Armour and Co. bringing the total number of Armour Ammonia distribution plants in the nation to 14. The new plants are located in Los Angeles and Oakland, Calif., and East Liverpool, Ohio. The Los Angeles and East Liverpool operations will also include bulk tank truck facilities.

Deaths of Industry Persons

▶▶WORLD AUTHORITY on alcohol and inventor of dry ice, Dr. Gustave T. Reich, died late in August at his Philadelphia home, aged 67. Dr. Reich is credited with 95 patents relating to processing food and other products. For 17 years he was technical director and assistant to the president of the Pennsylvania Sugar Company. He had been president of the Franco-American Chemical Works and was commended by the President of the United States during World War II as well as by societies in this country, Cuba and Great Britain. At the time of his death he was with Federal Yeast Corp., Baltimore.

▶▶GABRIEL BROS. Co., Los Angeles, lost its general manager in the death of Rudolph G. Hoening, 54. He died in mid-August. Hoening had been with the ice manufacturing and frozen food processing firm for 37 years.

▶▶TRANSPORTATION director Harold C. Emerson, Minute Maid Co., died at Orange Memorial Hospital, Orlando, Fla., on September 10. Emerson was formerly vice-president of Seabrook Farms Co., Bridgeton, N. J. until he joined Minute Maid as warehousing and transportation director in 1956. Surviving are his wife, daughter and a son.

VAN RENSSELAER H. GREENE ASSOCIATES
CONSULTING ENGINEERS
VAN R. H. GREENE — NILS R. BERNZ

REFRIGERATION SPECIALISTS
COLD STORAGE—FOOD PROCESSING—INDUSTRIAL

ENGINEERING SURVEYS, APPRAISALS, COST STUDIES,
COMPLETE ENGINEERING DESIGNS FOR TEMPERATURE AND HUMIDITY CONTROL.

11 PARK PLACE **NEW YORK 7, N.Y.**

ECONOMIZE! STANDARDIZE!
on "Rempe"
PIPE BENDS AND COILS FOR REFRIGERATION

Rempe Shell and Coil Assembly for sub-zero or high temperature heat transfer.

In Rempe Coils you get Top Engineering and Quality Construction -- the best in Refrigeration Equipment for long-life and low maintenance.
For Ammonia or Freon. All materials — Stainless Steel, Copper, Steel.

REMPE COMPANY
348 N. Sacramento Blvd., Chicago 12, Ill.

Classified Advertising

All classified advertisements are payable in advance. Except for Positions and Help Wanted classifications, this section is reserved exclusively for USED equipment.

RATES: 20c per word; minimum 25 words. $2.00 per line for bold face headings: $15.00 per inch for line listings.

Position and Help Wanted

REPRESENTATION WANTED

for broad line of industrial refrigeration equipment. Several territories having an excellent sales potential are available. Write to Imeco Incorporated, 3033 W. Belmont Ave., Chicago 18, Ill.

WANTED—Chief engineer, cold storage operation; multi plant company, eastern location. Full charge refrigeration and maintenance. Give experience, age, salary desired first letter. Write Box OT-6, c/o Industrial Refrigeration.

USED EQUIPMENT—wanted & for sale

FOR QUICK SALE

Complete Worthington refrigeration system, capable 1700 ton, very fine condition, value new over $750,000, priced now under $200,000. Located Middle West. Pictures, details available. Inspection possible. Born Company, 80 East Jackson Boulevard, Chicago 4, Illinois. WAbash 2-3299

FOR SALE — SEE IN OPERATION
Complete cold storage engine room ammonia equipment including Frick 11½ x 8 — D.C. to 60 h.p., 400 r.p.m. Worthington 7 x 7 D.C. to 50 h.p., 400 r.p.m. Worthington horizontal high-low duplex d.c. to 100 h.p., 225 r.p.m. Vilter 10½ x 10½ belt drive by 100 h.p., 1750 r.p.m. Vilter 9½ x 7 belt drive by 30 h.p., 1200 r.p.m. All force feed lubricated; motors 220 volt 3 phase. MG sets, starters, panels spare parts included.
CENTRAL WAREHOUSE COMPANY
739 Pillsbury Ave. St. Paul, Minn.
Phone: MIdway 6-2831

WANTED—4 used 8x8 to 10½x10½ ammonia compressors, or in the V or VW type of 50 to 75 tons capacity. Write Box OT-2, c/o Industrial Refrigeration.

WANTED—Used ice plants and refrigeration equipment. Address Box OT-4, c/o Industrial Refrigeration.

EQUIPMENT WANTED—Used compressors, motors, condensers, etc., in good shape. Pappas Refrigeration Co., 401 Louisiana St., Houston, Texas.

FOR SALE—4x4 York with motor on base, $250.00. 8x8 York $300.00. Write E. Niebling, 1546 St. Clair Ave., Mt. Healthy, Cincinnati 31, Ohio.

FOR SALE — Refrigeration equipment; ice equipment; new, used. Advise us your needs. Use "QUICKSEAL" — stops brine tank leaks; easy, efficient, economical. Born Company, 80 East Jackson Boulevard, Chicago 4, Illinois. WAbash 2-3299

FOR SALE—Two 10 ton "Freon" Westinghouse condensing units with coils, 550 volt, 3 phase motors, $500.00 each. Silver Spring Skating Center, 9028 W. Silver Spring Drive., Milwaukee, Wisc.

FOR SALE—Complete 50 ton all Frick ice making plant; in very good condition. Bargain f.o.b. cars Central East Coast area. Born Company, 80 East Jackson Boulevard, Chicago 4, Illinois. WAbash 2-3299.

FOR SALE
350 h.p. Carrier water chilling unit.
(1) 9 cylinder (2) 6 cylinder type AHP Frick "Eclipse" compressors.
(2) type 15Q6 Carrier cold air diffusers.
(2) 10 h.p. Gardner Denver air compressors with air receiver.
Ammonia compressors 6x6 to 10x10.
JOHN F. CARSON
A & Venango Sts. Philadelphia 34, Pa.
GArfield 6-2221

QUICK RESULTS with Classified Ads

not a plaster
not a paint
...it's a
NEW
CONCEPT
in industrial
wall finishes
by...

• It's not a plaster . . . not a paint. Swift's Adcote wall finish was especially developed to provide industrial users with a high moisture resistant finish that is easy to apply yet has good adhesion to many different surfaces and presents a clean, white, uniform appearance.

You can use it over board type insulation or masonry surfaces. Use it on cooler walls, concrete, brick, concrete block or even apply it to damp surfaces. It shows good adhesion to many surfaces as tested by Swift and it offers chemical, rodent, vermin, and mold resistance.

Adcote finished walls are fire retardant and fully washable. Adcote is supplied as a dry powder and a liquid which are mixed together prior to use. Though usually trowelled on, spray or brush can be used.

A trial in your own plant is the best way to prove the superiority of this new Swift concept in wall finishes. Return the coupon for details on a trial order today.

ONE TRIAL IS BETTER THAN A THOUSAND CLAIMS

Swift

To Serve Your Industry Better

Swift & Company Ad 5
Adhesive Products Department
Chicago 9, Ill.

☐ Send descriptive bulletin.
☐ Send information on trial order.

Name_____

CLIP TO YOUR LETTERHEAD AND MAIL!

ADVERTISERS

Allied Chemical Corp., Nitrogen Div. ..... Inside Front Cover
American Hair & Felt Co. 27
Armstrong Cork Co. 6

Ball Valve Co. 34
Bower Chemical Mfg. Co., Henry 39
Brown Mfg. Co., Inc., K. G. 40
Butcher Boy Refrigerator Door Co. 1

Chicago Nicole Mfg. Co. 42
Classified Advertising 43
Conveyor Co., The 39
Creamery Package Mfg. Co., The 32

General Chemical Div., Allied Chemical Corp. 5
Gifford-Wood Co. 25
Greene Associates, Van R. H. 43

Howe Ice Machine Co. 30
Hubbell Corp. 35

IMECCO, Inc. 36

Jamison Cold Storage Door Co. ..Back Cover
Johns Manville Corp. ..... 22 and 23

King Co. of Owatonna, The 31
King-Zeero Co. 24
Kohlenberger Engineering Corp. 38

National Pipe Bending Co. 33
Niagara Blower Co. 37
Nickerson & Collins Co. 41

Ohio Galvanizing & Mfg. Co., The 42

Recold Corp. 19
Refrigerating Specialties Co. 29
Rempe Co. 43

Swift & Co. 44

United Cork Companies 2

Vogt Machine Co., Henry ..Inside Back Cover

Wanted and For Sale Advertising 43

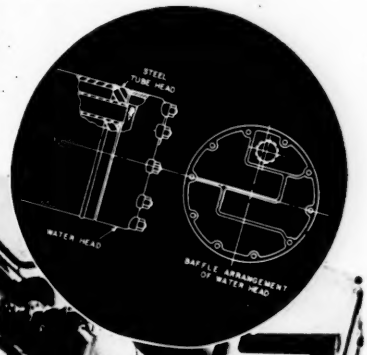
$ave Power and REFRIGERATION COST

Vogt Condensers, because of their correct design, STEP UP the rate of heat transfer and STEP DOWN head pressures. With the liquid delivered at a lower temperature, smaller compressor capacity is needed, saving in original as well as operating costs.

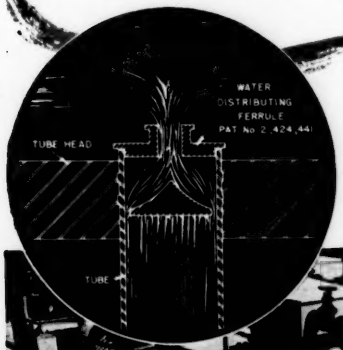
One of the two basic types illustrated will fit your operations exactly. Install Horizontal Multipass (closed type) for use with clean waters. Where the water is hard, forms scale, contains mud or promotes fungus growth, Vertical Single Pass (film type) which can be cleaned in operation, are recommended.

Horizontal Multipass Condensers
(Closed Type)

Water circulated in tubes traverses the length of the unit a number of times as determined by baffles in the heads.



375 tons capacity Multipass Condenser installation at Railways Ice Co., Belen, New Mexico.



Vertical Single Pass Condensers
(Film Type)

Patented ferrules give equal distribution of water to and over the surfaces of all tubes in a unit.

Battery of eight 42"x 16'-0" Vertical, Single Pass, Condensers at Armour and Company, National Stockyards, Illinois.

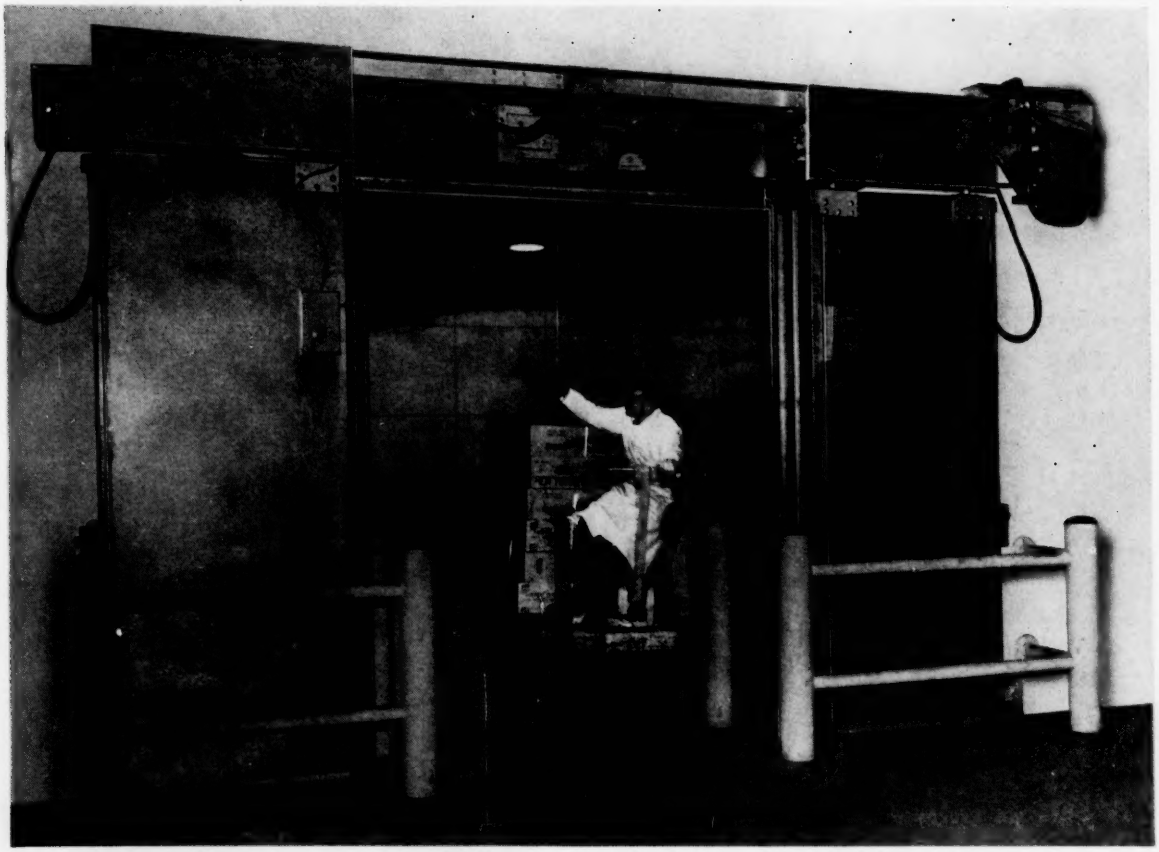
HORIZONTAL and VERTICAL TYPES SHELL and TUBE CONDENSERS For Every Service

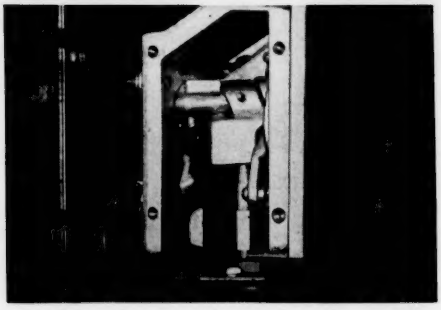
Write For Bulletin RC-2
Address Dept. 24A-RIIR

HENRY VOGT MACHINE COMPANY
INCORPORATED
1000 W. ORMSBY ST., LOUISVILLE 10, KY., U.S.A.
Branch Offices: NEW YORK, CHICAGO, CLEVELAND, DALLAS, PHILADELPHIA, ST. LOUIS, CHARLESTON, W. VA.

Vogt REFRIGERATION CONDENSERS

New Jamison *Electroglide** Power Door speeds traffic, saves refrigeration *automatically!*





EXCLUSIVE CAMLOK COMPRESSION SEAL—Jamison Camlok cams doors "in" against frame and "down" against floor at all points.

These other exclusive features mean dependable, smooth operation.

SHOCK ABSORBER CHAIN LINK—reduces wear and tear

SPRING LOADED SUSPENSION—minimizes power requirements

IMPROVED SAFETY EDGE—sensitive full height and full travel of door

SEALED-IN-OIL REDUCTION GEAR—trouble-free operation, minimum maintenance

Electroglide offers famous Jamison Cold Storage Door quality and performance plus a completely new design for power operation. Both bi-parting and single leaf Electroglides are available to meet all job requirements.

High volume traffic can now speed on its way in busy cooler and freezer operations with minimum loss of refrigeration. Electroglide is specifically designed to accelerate truck movement with its instant automatic opening and closing.

Rapid smooth opening—Spring suspension helps doors open easily and smoothly. Doors move "out" and "up", riding on level tracks with gaskets clear of sill and frame.

Electroglide is made for both cooler and freezer use. Write today for new Electroglide bulletin to Jamison Cold Storage Door Co., Hagerstown, Md.

*JAMISON TRADEMARK

JAMISON

COLD STORAGE DOORS